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CITY AND COUNTY OF SAN FRANCISCO
PUBLIC UTILITIES COMMISSION

PRELIMINARY

ANNUAL REPORT

FISCAL YEAR 1968-69

HETCH HETCHY WATER AND POWER SYSTEM
AND
BUREAU OF LIGHT, HEAT AND POWER

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G. L. MOORE
GENERAL MANAGER



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CITY AND COUNTY OF SAN FRANCISCO

PUBLIC UTILITIES COMMISSION

A N N U A L R E P O R T

FISCAL YEAR 1968-69

HETCH HETCHY WATER AND POWER SYSTEM

AND

BUREAU OF LIGHT, HEAT AND POWER

O. L. MOORE
GENERAL MANAGER

ANNUAL REPORT

I. ORGANIZATION AND FUNCTIONS

Under policies established by the San Francisco Public Utilities Commission, HETCH HETCHY WATER AND POWER and BUREAU OF LIGHT, HEAT AND POWER serves the City and County of San Francisco in the dual function of operating department and service bureau.

Hetch Hetchy Water and Power System is a municipally-owned system of storage reservoirs and aqueducts which collects water from the Tuolumne River watershed and delivers it to the San Francisco Water Department. Approximately three-fourths of the water supplied in San Francisco and the Water Department service area comes from this source. Hetch Hetchy also operates and maintains hydroelectric generating stations and high voltage transmission lines for the production and distribution of electric energy. Hetch Hetchy revenues support all its expenses.

The Bureau of Light, Heat and Power administers contracts for furnishing electric, gas and steam services to municipal departments and handles monthly billings. It also administers contracts for operation and maintenance of City-owned street lighting. Financing, design, and construction of City-owned street lighting improvements are under the jurisdiction of Department of Public Works. In accordance with provisions of the City and County Administrative Code, plans for these improvements must be approved by the Public Utilities Commission through this bureau. This bureau is financed by appropriations of municipal departments and gas tax funds.

For fiscal year 1968-69, the Department administered budgeted funds for operation, maintenance, engineering, and construction as follows:

<u>Budget</u>	<u>No. of Employees</u>	<u>Total Amount Appropriated</u>
Hetch Hetchy Water and Power	196	\$ 16,467,121
Bureau of Light, Heat and Power	12	5,944,604
1955 Hetch Hetchy Power Bond Fund	--	67,668*
1961 Municipal Water System Bond Fund	--	163,768*
<hr/>		<hr/>
TOTAL	208	\$ 22,643,161

* Does not include funds previously appropriated for construction under way or completed during fiscal year 1968-69

II. HETCH HETCHY WATER AND POWER SYSTEM

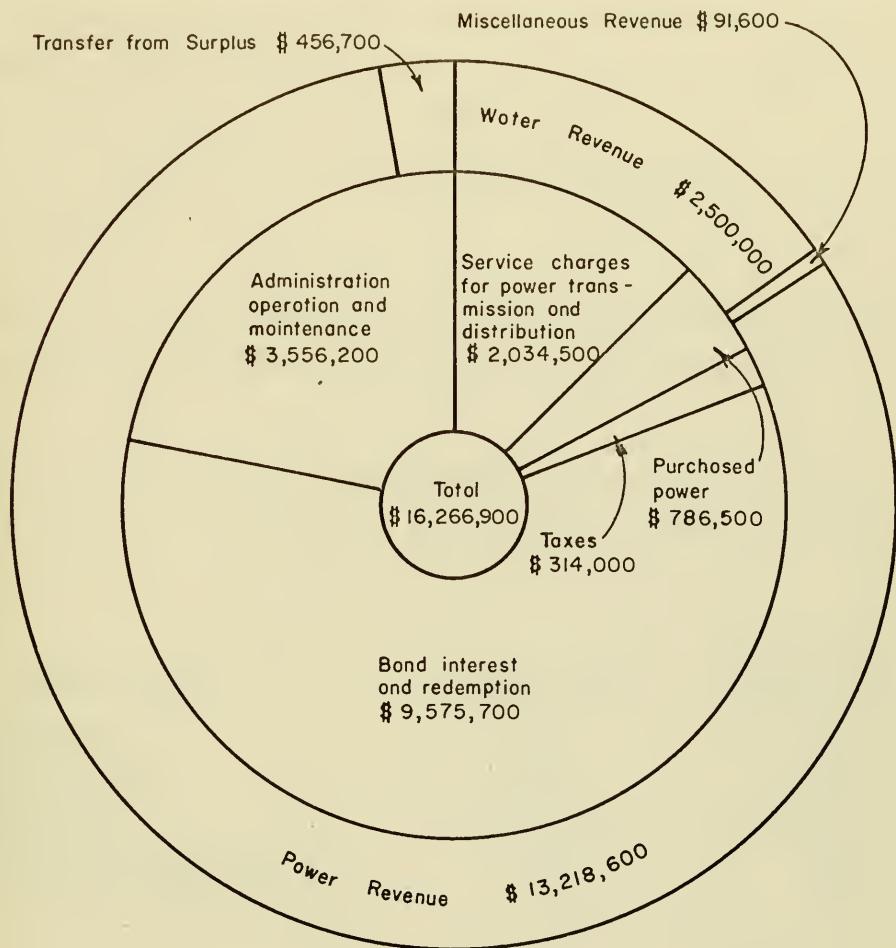
Revenue and Expenditures

Revenue from Hetch Hetchy Project operation is derived principally from two sources:

1. Budget transfer from San Francisco Water Department.
2. Sale of electric power and energy to San Francisco municipal departments, Modesto and Turlock Irrigation Districts in the San Joaquin Valley, and eight industrial customers -- Kaiser Cement and Gypsum Corporation's cement plant and Kaiser Aluminum and Chemical Corporation's aluminum foil plant, in Santa Clara County; chemical plants of Dow Chemical Company and Hercules in Contra Costa County; chemical plants of California Ammonia Company and Air Products and Chemicals in San Joaquin County; chemical plant of Valley Nitrogen in Fresno County; and the Army Ammunition Plant at Riverbank in Stanislaus County, operated by Norris Industries.

Budget transfer from the San Francisco Water Department was \$2,500,000, compared to \$3,500,000 last year. Gross sales of electric energy amounted to \$13,219,642, compared to \$12,867,757 during the year 1967-68. This increase in electric revenue reflected the increase in sales during the year, 1,820,102,997 kilowatt-hours as compared to 1,815,498,461 kilowatt-hours for 1967-68. Revenue for service orders, rentals, meals and miscellaneous items was \$91,641.

Power and energy delivered to all City Departments increased by 6.0 percent this year with a 12.3 percent increase for the San Francisco International Airport. Hetch Hetchy power is furnished to City Departments at cost, representing a saving to taxpayers for 1968-69 of \$857,690, compared to what power would cost if supplied by the local investor-owned utility.



*HETCH HETCHY REVENUES AND EXPENDITURES
FISCAL YEAR 1968-69*

Power and energy delivered to Modesto and Turlock Irrigation Districts increased by 7.3 and 6.1 percent respectively, this year. The increase reflected the steady load growths experienced by these two Irrigation Districts in the San Joaquin Valley who in 1968-69 purchased over 90 and 65 percent of their total power requirements from the City, respectively.

Interest and redemption costs for the year on outstanding Hetch Hatchy bonds totaled \$9,575,728.

Tables 1, 2 and 6 show comparative data on receipts, expenditures and sales of water and power from operation of the Hetch Hatchy water and power system.

Taxes

Taxes for 1968-69 on utility properties under jurisdiction of Hetch Hatchy, located outside the City and County of San Francisco, were paid in the following amounts:

<u>Tax-Levying Body</u>	<u>Assessed Value</u>	<u>Total Amount of Taxes Paid</u>
Alameda County	\$ 2,200	\$ 225.34
San Joaquin County	27,605	2,423.14
San Mateo County	2,335	221.92
Stanislaus County	75,730	7,085.08
Tuolumne County	3,701,090 (a)	302,838.02
Banta-Carbona Irrigation District	3,192	127.68
Oakdale Irrigation District	12,320	862.40
West Stanislaus Irrigation District	1,800	90.00
<hr/>		<hr/>
TOTAL	\$3,826,272	\$313,873.58

(a) Includes \$3,000,000 assessment for water rights.

Water Production And Transmission

The winter of 1968-69 produced record precipitation on the City's mountain watershed and the resulting snowmelt runoff set new records. Total precipitation received was 160% of normal. The City's three storage reservoirs, Hetch Hetchy, Lake Lloyd and Lake Eleanor were full on June 30. This will assure full power production for the coming year. Careful scheduling of releases contributed measurably to the prevention of flooding in the San Joaquin Valley downstream.

During the year, 66,731,100,000 gallons of water were diverted from the Tuolumne River watershed through the Hetch Hetchy Aqueduct for delivery to the San Francisco Water Department, representing 79% of the City's total customer consumption. In addition, 215,870,000 gallons were delivered to the United States Atomic Energy Commission at Mocho Shaft of the City's Coast Range Tunnel for use at the Lawrence Radiation Laboratory at Livermore; 6,434,700 gallons were delivered to the Groveland Community Services District in Tuolumne County.

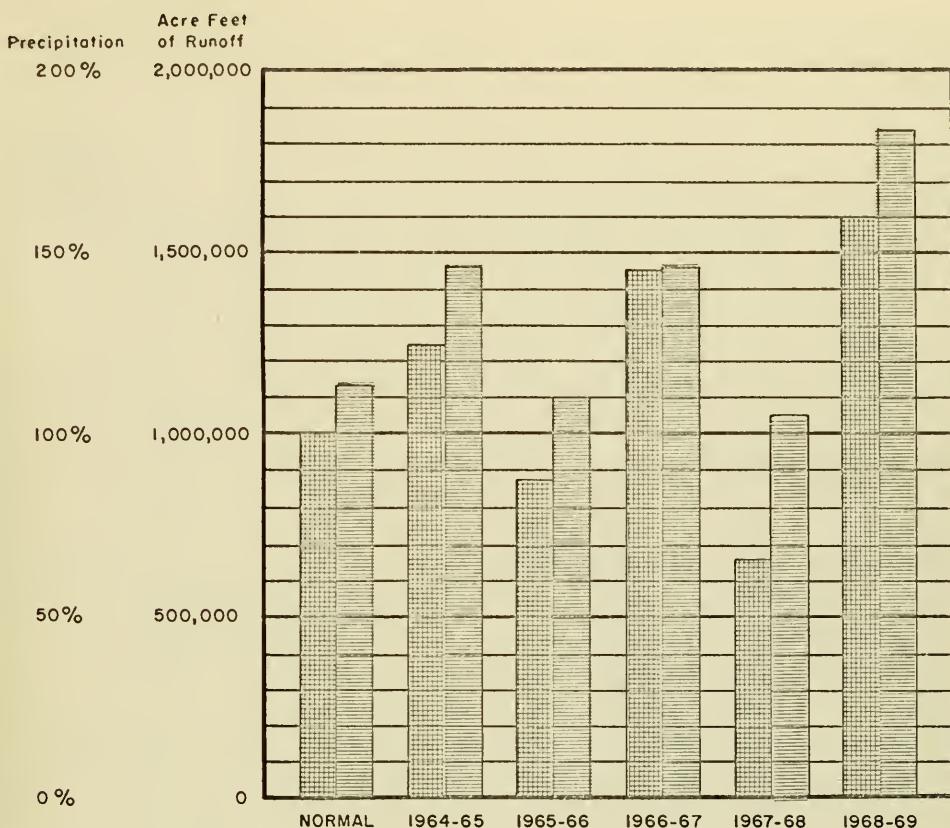
Table 3 shows comparative data on precipitation, runoff, storage and delivery of the Hetch Hetchy Water Supply system.

Power System Operation

The new Moccasin Powerhouse began operation on January 27, 1969. This powerhouse replaced the old Moccasin Powerhouse, which was constructed in 1925 and provided \$115,000,000 in power revenues for the City during its 44-year life. A chart showing growth in Hetch Hetchy power revenue over the past 10 years is included in this report.

Renegotiation of Electric Service Contract with Modesto Irrigation District

A new contract was negotiated with the Modesto Irrigation District providing for an increase of 11.5 percent over the rates in the existing contract which was to expire in 1972. The new agreement was made effective July 1, 1968, with termination date of July 31, 1975.

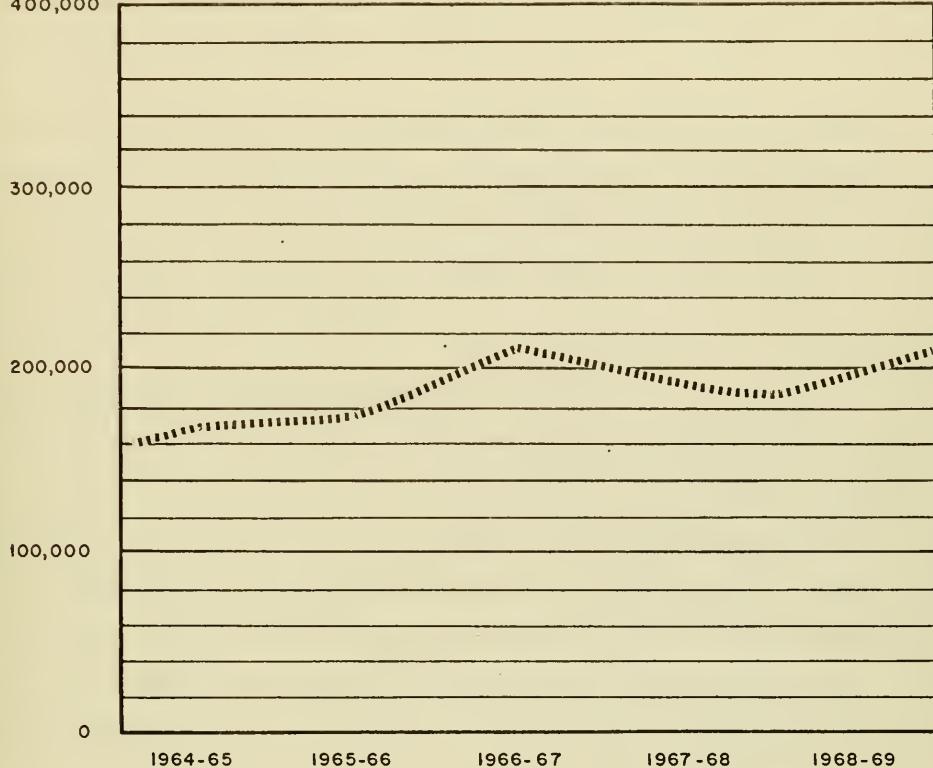


■ Precipitation % Normal

■ Acre Feet of Runoff

**RUNOFF FROM SAN FRANCISCO'S
TUOLUMNE RIVER WATERSHED**

Acre Feet
Delivered
To SFWD
400,000



DELIVERIES OF WATER TO SAN FRANCISCO WATER DEPARTMENT

New Electric Customer

As a result of the record precipitation received on the City's watershed this year, power generation was maintained at maximum capacity at Dion R. Holm and Robert C. Kirkwood Powerhouses from February 1 to September 1, 1969. Additional power accruing from this heavy water yield amounted to 170,000,000 kilowatt-hours by the end of June, 1969.

In order for the City to utilize the excess power and energy from this spring's record runoff, the Pacific Gas and Electric Company assigned to City, effective May 1, 1969, its electric service contract with Valley Nitrogen Producers, Inc. at Helm, California. Addition of this customer resulted in approximately \$95,000 additional revenue per month.

Proposed Additions to Hetch Hetchy Project

On December 2, 1968, Mayor Joseph L. Alioto announced the completion of a study for the Public Utilities Commission of a proposed \$210 million power development for the Hetch Hetchy Project. Its key features include three new dams (one replacing Eleanor Dam), three new powerhouses (one of which would be a pumped storage plant), two new tunnels and two new transmission lines. The development would more than triple the present Hetch Hetchy System generating capacity of 292,500 kilowatts.

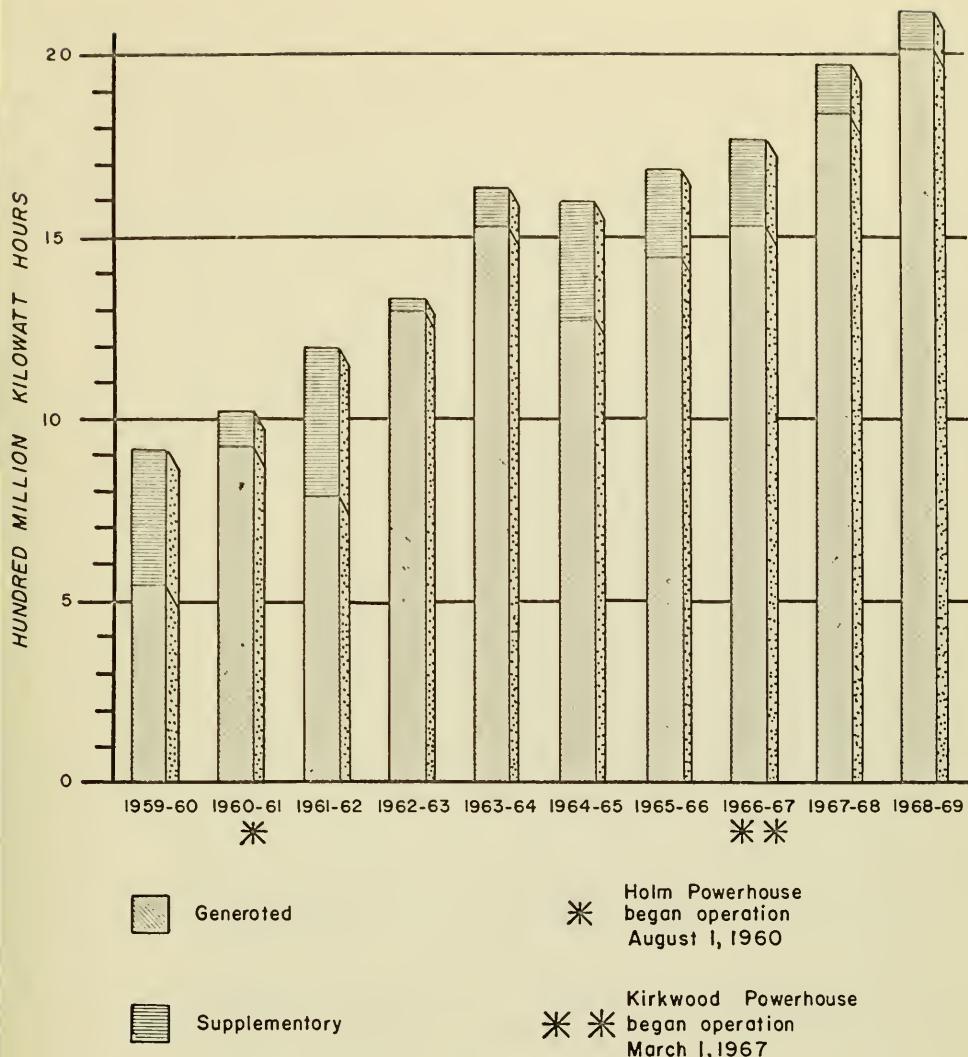
As recommended by the study consulting engineer team of R. W. Beck and Associates - Clair Hill and Associates, the new power facilities would be constructed in three phases over a period of approximately eight years.

On the basis of power values and estimated construction costs projected by the consultants, this additional development would net over \$90 million in the 40 year repayment period and \$13,600,000 annually thereafter.

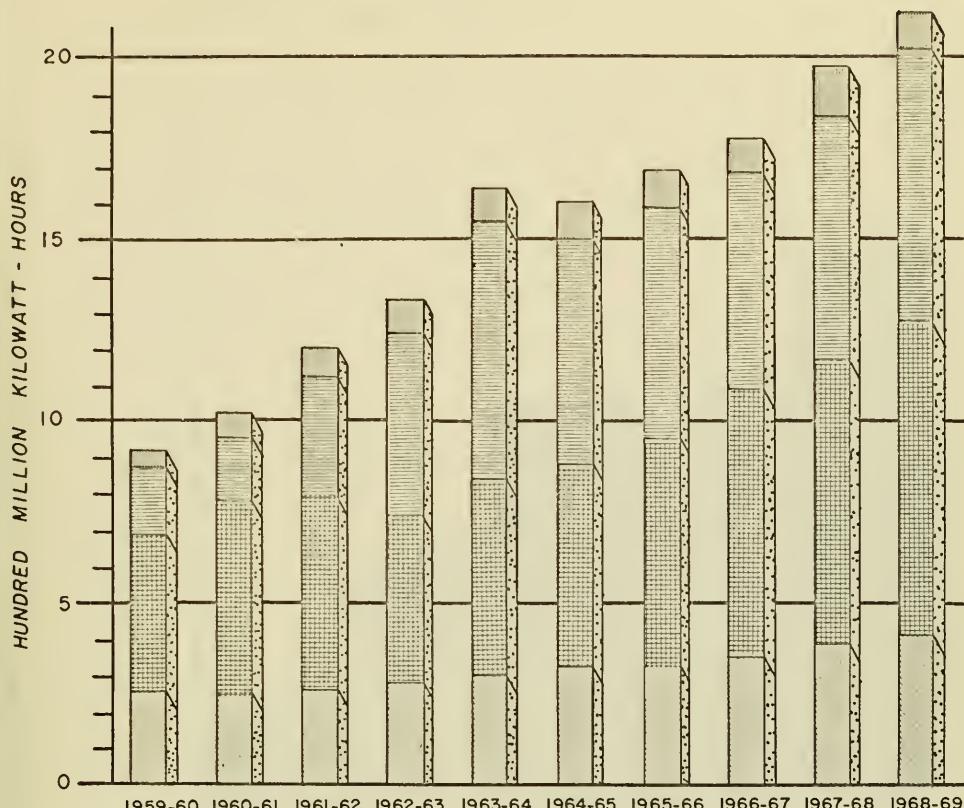
Under existing agreement with the City, the Modesto and Turlock Irrigation Districts may participate in the costs and benefits of this proposed development up to a maximum of 50%. The Districts have the proposal under review.

Replacement of Moccasin Powerhouse

On January 10, 1969, Unit Nos. 3 and 4 of the Moccasin Powerhouse were shut down in order to connect their penstocks to Unit No. 2 of the new Moccasin Powerhouse. On January 27, the new Unit No. 2 commenced generating electrical energy and it was connected to the City's electric transmission system. On February 7, Unit Nos. 1 and 2 of the Moccasin Powerhouse were shut down to connect their penstocks to Unit No. 1 of the new powerhouse. This brought to an end power generation at the old Moccasin Powerhouse after almost 44 years of operation.



**AVAILABLE ELECTRIC ENERGY-GENERATION & SUPPLEMENTARY
HETCH HETCHY POWER SYSTEM**



Lost in Transmission
& Distribution

Delivered to Irrigation
Districts

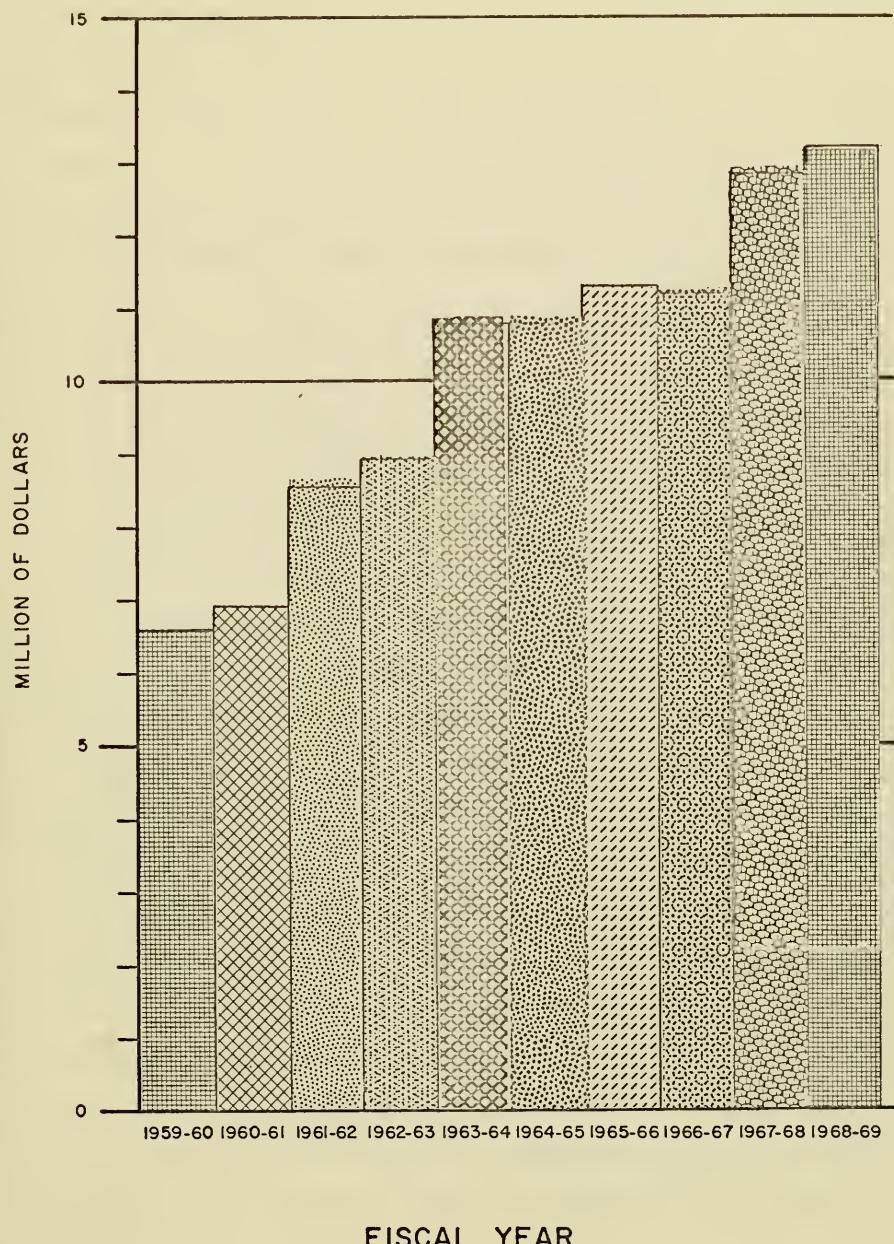
Delivered to Industrial
& Misc. Customers

Delivered to Municipal
Departments

DISTRIBUTION OF ELECTRIC ENERGY

HETCH HETCHY POWER SYSTEM

REVENUE FROM SALE OF ELECTRIC ENERGY



III. UTILITIES ENGINEERING BUREAU

On January 1, 1969, the Utilities Engineering Bureau went out of existence. It was created in 1940 when the Electric Power Bureau was combined with the Hetch Hetchy Water Supply and the Bureau of Engineering to form a single organization called "Hetch Hetchy Water Supply, Power and Utilities Engineering Bureau". As did its predecessor, the Bureau of Engineering, the Utilities Engineering Bureau provided engineering services to the Hetch Hetchy Project, the San Francisco International Airport and the Municipal Railway.

During the 36 years that the Bureau of Engineering and the Utilities Engineering Bureau were in existence, its managers and staff were responsible for the design and construction of over \$270,000,000 of improvements for the three utilities. They provided the engineering "know how" that developed the original Mills Field to San Francisco Municipal Airport and then to San Francisco International Airport, which now ranks fourth in the world. They engineered the development and expansion of the Municipal Railway from a few cross-town street car lines to a complete transit system serving every section of the City, and participated in the planning of the Bay Area Rapid Transit System and its interfaces with the Municipal Transit System. Under their leadership, the primary phases of the Hetch Hetchy Project were completed and expanded. The water delivery capability of the system has been increased from an original capacity of 60,000,000 gallons per day delivered to the Bay Area to a current capability of over 300,000,000 gallons per day. Storage facilities in the Sierra Nevada have been firmed up to a capacity sufficient to supply in excess of 400,000,000 gallons per day. The power generation capacity was increased from 70,000 kilowatts to 300,000 kilowatts along with the necessary transmission lines, switchyards and substations to utilize the increased energy. Preliminary planning was initiated for further expansion of the electrical generating capability of the system.

Airport Engineering and Construction

During the period from July 1, 1968 to October 19, 1968, when the Airport Engineering Division assumed responsibility, the Utilities Engineering Bureau prepared plans, specifications and bidding documents for projects totaling \$4,213,262.

During this same period, tenant plans for construction of over \$15,000,000 of improvements and additions at San Francisco International Airport were reviewed by the Utilities Engineering Bureau prior to approval by the Public Utilities Commission.

The Bureau also assisted Airport management in the selection of engineering consultants for the design of a new sewage treatment plant for the Airport and also for the selection of consultants to study the problem of solid waste disposal at the Airport.

Following is a summary of Airport contracts prepared by the Bureau prior to its being relieved of Airport responsibility on October 19, 1968:

SAN FRANCISCO INTERNATIONAL AIRPORT

CONTRACTS - BIDS

July 1, 1968 to October 19, 1968

<u>Contract No.</u>	<u>Title</u>	<u>Date Bid</u>	<u>Low Bid</u>
397	General Aviation Parking Apron and Taxiway Extension	Aug. 29, 1968	\$ 267,150
487	Extension, Terminal Apron and Relocation of Taxiway B	Oct. 17, "	2,215,243
491	Signs, South Terminal, Piers B & E	July 18, "	25,053
498	Alterations to Baggage Conveyor Systems 6 and 7, South Terminal	July 18, "	86,393
523	Installation & Alterations to Auditing & Space Inventory Equipment, Garage	Sept. 19, "	42,560
535	Additions to System #9, South Terminal Baggage Conveyors	Aug. 8, "	47,474
538	Air Cargo Building No. 7	July 18, "	340,934
541	Pavement Leveling & Reconstruction, Runway 1R-19L	Aug. 8, "	495,600
545	Pavement & Utilities for Cargo Building No. 7	July 18, "	549,366
548	Relocation of Steam Lines, South Terminal	Sept. 12, "	13,860
549	Installation of Telephone Ducts, San Felipe Ave. to R-6	Sept. 19, "	11,321
552A	Relamp Lighting Fixtures, Upper Lobby, Central Terminal	Aug. 22, "	5,244
554	Locker Room for Stationary Engineers, South Terminal	July 18, "	3,250
558	Construction of Employee's Parking Lot C	Oct. 10, "	56,463
559	Air Conditioning, Room 146, Central Terminal	July 18, "	2,400
561	Handrails, Pier C Gateroom	July 18, "	1,875
565	Roof Repair, Building C-01	Aug. 8, "	21,314
567	Remodel First Floor, Building C-03	Aug. 15, "	27,762
<hr/>			
TOTAL			\$ 4,213,262

Municipal Transit System Engineering and Construction

The Municipal Transit System Engineering Division took over responsibility for all engineering for the Muni on January 1, 1969. During the period from July 1, to December 31, 1968, the Bureau prepared plans, specifications and bidding documents for contract work totaling \$215,191.

Plans, specifications and working drawings were also underway for the reconstruction of portions of the cable car track and cable system and for the repaving of the Kirkland Motorcoach Yard at the time of the termination of the Utilities Engineering Bureau.

Following is a summary of Muni contracts prepared by the Bureau prior to its termination on January 1, 1969:

MUNICIPAL TRANSIT SYSTEM

CONTRACTS - BIDS

July 1, 1968 to December 31, 1968

<u>Contract No.</u>	<u>Title</u>	<u>Date Bid</u>	<u>Low Bid</u>
542	Interior Painting, Washington-Mason Carbarn	July 11, 1968	\$ 6,340
547	Twin Peaks Tunnel, Interior Painting at Forest Hill and Eureka	Oct. 3, 1968	8,645
552	Relocate Overhead for Tracks 1,2,3 & 4	Aug. 1, 1968	21,780
553	Alterations to Elkton Shops & Related Work	Sept. 12, 1968	25,300
554A	Remove & Relocate Ladder Tracks 1,2,3 & 4	Aug. 22, 1968	52,655
555	Alterations to Potrero Coach Yard	Oct. 10, 1968	72,924
559	Reroof 8th and Geary Substation		3,350
560A	Exterior Painting, Tunnel Portals, Twin Peaks and Sunset	Nov. 21, 1968	8,447
561	Turk St. Substation, Interior Painting	Oct. 24, 1968	8,300
P. O.	50 hp Air Compressor, Elkton Yard	Sept. 6, 1968	7,450
		TOTAL	\$ 215,191

IV. HETCH HETCHY ENGINEERING AND CONSTRUCTION

South Fork Crossing

The Hetch Hetchy Aqueduct crosses the South Fork of the Tuolumne River by means of approximately 190 feet of 9-1/2 foot diameter steel pipeline. Because this crossing is at the bottom of a steep gorge, the pipeline, and thus San Francisco's water supply, is in constant danger of damage due to falling rock. Bids were received at the end of the year for a contract to replace the exposed pipe crossing with a tunnel-siphon passing beneath the river bed and connecting to the tunnels on each side.

Red Mountain Bar Wasteway Alterations

At the end of the year a contract was awarded for alterations to the present wasteway and overflow structure at the westerly end of Red Mountain Bar Siphon, so that the maximum aqueduct flow of 300 million gallons per day possible with the three San Joaquin Pipelines in service can be controlled at this point. The main alterations consist of eliminating the present open overflow basin by a short length of steel pipe; the installation of a 10-foot diameter slide gate at the entrance to the Foothill Tunnel; and the construction of an overflow shaft to limit the load on the gate and to spill excess water into Don Pedro Reservoir.

Improvements to Gaging Station Below O'Shaughnessy Dam

During the year, the gaging station approximately 2 miles downstream from O'Shaughnessy Dam was improved to assure accurate measurement of water releases. The work consisted of constructing a new concrete control section; installing new instruments, and erection of telemetering and electrical supply lines to the gaging station.

Replacement of Diversion Conduit Liner, Moccasin Reservoir

During the year, the existing steel liner in the invert of the 10-foot diameter diversion conduit under Moccasin Reservoir was replaced with 1/4-inch thick steel plates. This conduit prevents local runoff from entering the reservoir which is an element of the Hetch Hetchy Aqueduct System. The old liner had become torn and distorted by rocks and debris carried through the conduit by high velocity flows during heavy rains.

Warnerville Substation

Construction was begun to expand the facilities of Warnerville Substation to meet the increasing demands of the Modesto Irrigation District, which is the City's major electric power customer. The construction is being performed under two contracts; the first, which was completed during the year, for the construction of a reinforced concrete foundation for a City-purchased transformer, and the second, which was still in progress at year's end, for the installation of the transformer, circuit breakers and all appurtenant work required to increase the capacity of the substation from 150,000 KVA to 300,000 KVA.

Cherry Valley Access Road

Cherry Valley Access Road, constructed in 1950 by the City and subjected to extremely heavy traffic loads during construction of the Canyon Cherry Power Development, commences at State Highway 120 and extends to Cherry Valley Dam, approximately 25 miles distant. Two contracts were awarded to widen and resurface with two inches of asphaltic concrete the badly deteriorated roadway. The first contract, completed during the year, resurfaced the 6-mile section of road between Jones Point and the Cherry River Bridge; the second, awarded at the end of the year, is to resurface the 6-mile section between Highway 120 and Jones Point, and to widen portions of the 13-mile section between Cherry River Bridge and Cherry Valley Dam, as required by the U. S. Forest Service.

Robert C. Kirkwood Powerhouse Access Road

Work was begun during the year to grade and place rock surfacing on a section of access road which was relocated due to the construction of Robert C. Kirkwood Powerhouse. The completion of this contract will provide year-round access to the City's stream gaging station located upstream from the powerhouse.

Pave Access Road, Tesla Portal

Heavy traffic due to the construction of San Joaquin Pipeline No. 3 and the alterations to Tesla Portal caused considerable damage to the unpaved access road and adjacent parking area at Tesla Portal. Under a contract completed this year, the access road and parking area were graded, compacted and paved with a 2-inch thick asphaltic concrete surfacing.

New Don Pedro Project

During fiscal year 1968-69 substantial progress was made on the construction of the giant New Don Pedro Project. This \$100 million multi-purpose project is a joint undertaking of the Turlock and Modesto Irrigation Districts and the City and County of San Francisco. The reservoir will have a storage capacity of 2,030,000 acre-feet and will be backed up behind an earth-rock dam approximately 580 feet high to be constructed approximately one and one-half miles downstream from the Districts' existing Don Pedro Dam, which will be inundated.

The reservoir will provide the additional storage capacity, on an exchange basis, to enable the City to meet its water requirements and those of its service area to the end of this century. The Districts will gain additional storage to firm up their irrigation requirements and power needs. The United States Army Corps of Engineers by contributing \$5,464,000 to the cost of the Project will acquire the

necessary flood control on the Tuolumne River to handle anticipated future flood flows. The State of California will also contribute to the cost for the recreational benefits to be provided by the Project. The State Legislature has authorized an amount up to \$8,750,000 for State participation.

The New Don Pedro Dam and Reservoir are located on the Tuolumne River approximately 35 miles east of Modesto where the Tuolumne River emerges from the Sierra foothills.

Diversion of the river through a concrete-lined diversion tunnel was accomplished in September, 1968. This permitted commencement of construction of the dam embankment which contains over 17,000,000 cubic yards of material. Excellent progress since that time has seen the embankment rise in the gorge which is the dam site. Construction of the controlled and emergency spillways in a saddle near the dam site was well underway at year's end. Reservoir site clearing was approximately 75% completed. The Project is scheduled for completion in the spring of 1971.

During the year, plans and specifications were prepared for three contracts designed to protect existing City installations from future inundation by the New Don Pedro Reservoir. These contracts will include the relocation of the cableway and stream gaging station above La Grange Dam; the relocation of the 115-KV Moccasin-Newark Transmission Line spanning the future reservoir; and the concrete encasement of the Red Mountain Bar Siphon of the Hetch Hetchy Aqueduct. The contracts will be performed under the jurisdiction of the Modesto and Turlock Irrigation Districts, funded by the New Don Pedro Project, and inspected by City forces.

V. STREET LIGHTING

General

The lighting of public streets within the City of San Francisco is provided by facilities which are 34% owned by the City, 63% owned by Pacific Gas and Electric Company, and a small percentage, 3%, jointly owned.

During the fiscal year 1968-69, maintenance and repair of City-owned installations were performed under two contracts. One provided for group replacement of lamps in accordance with schedules developed by the Department. A second contract covered work required for repair of defective and damaged equipment, painting, and miscellaneous maintenance.

Under contract, Pacific Gas and Electric Company furnished street lighting service as directed, including the furnishing, maintenance and operation of Company-owned facilities. Certain services were provided also for City-owned facilities, including switching and control, replacement of individual lamps and globes, and emergency work required during other than normal working hours.

Electric energy for all City and Company-owned street light operation was supplied by the Hetch Hetchy power system.

Operation and Maintenance

As of June 30, 1969, a total of 35,577 City-owned and Company-owned street lights were in service in public streets, parks, viaducts, overcrossings, tunnels, and underpasses. A summary of the number and types of units in service at the end of the fiscal year is shown in Table 11.

A total of \$1,172,021 was expended for operation, maintenance, and repair of the street lighting system. Of the total cost, \$12,226 was paid by the State for its share of operation and maintenance of street lighting at intersections on City streets which are part of the State highway system.

A summary of expenditures for operation and maintenance of street lighting for the fiscal year is shown in Table 12.

Improvements

Rehabilitation of street lighting in the existing underground districts continued under the 1964 Street Lighting Bond Issue and through the Road Fund. Newly created underground districts were relighted through the Road Fund. Engineering and contract supervision is performed by the Department of Public Works, subject to approval by the Public Utilities Commission, through the Bureau of Light, Heat and Power.

A total of 1,176 new street lights, valued at \$1,031,201, was added to the City-owned underground system. A summary of these additions is shown in Table 14, and the historical cost of City-owned street lighting construction is shown in Table 15.

Damages

A record number of 140 damage cases caused by vehicles to City-owned street lights, occurred during the fiscal year 1968-69. A total of \$50,069 was billed to the responsible parties.

A summary of number of accidents, cost of repairs, and collections is shown in Table 13.

VI. UTILITY SERVICES TO MUNICIPAL DEPARTMENTS

General

Electric energy supplied to municipal departments is generated on the Hetch Hetchy power system and delivered to various service points by transmission and distribution facilities of Pacific Gas and Electric Company under a wheeling contract.

Natural gas and steam supplied to municipal departments is furnished by Pacific Gas and Electric Company under a service contract.

Municipal Consumption of Electricity, Gas and Steam

During the fiscal year 1968-69, a total of 412,201,831 kilowatt-hours of electricity was supplied through 895 accounts for municipal uses, including street lighting and traffic devices. City departments paid to the Hetch Hetchy Project a total of \$4,238,562 for electricity. At the same time, 17,457,659 therms of natural gas was consumed through 516 accounts, and 2,219,800 pounds of steam was utilized by one account, for which Pacific Gas and Electric Company was paid \$895,967 and \$4,378 respectively.

A summary of consumption and expenditures for these commodities is shown in Tables 9 and 10.

San Francisco International Airport

The Department rendered service to San Francisco International Airport in the operation of City-owned electric distribution system within the Airport boundary. This service included performing necessary monthly meter readings, and preparing statements for billing Airport tenants. During the fiscal year, 79 tenants were supplied a total of 120,327,977 kilowatt-hours of electricity through 349 metered and 34 unmetered accounts, for which the Airport Department collected \$1,393,721. Also, one tenant was supplied 22,339,302 pounds of steam through three meters, for which the Airport Department received \$20,012.

TABLE 1
HETCH HETCHY WATER AND POWER

COMPARISON OF BUDGETED AND ACTUAL EXPENDITURES (INCLUDING ENCUMBRANCES)
FISCAL YEAR 1968-69

<u>OE</u>	<u>DESCRIPTION</u>	<u>BUDGET</u>	<u>ACTUAL</u>	<u>-UNDER, OVER</u>
110	Permanent Salaries	\$ 549,160	\$ 525,521	\$ -23,639
111	Allowance for Overtime	7,000	12,922	5,922
112	Allowance for Holidays	4,696	4,321	-375
113	Extended Work Week	22,437	5,747	-16,690
120	Temporary Salaries	20,000	39,272	19,272
130	Wages	839,262	828,389	-10,873
139	Wages - Gardeners	32,352	33,948	1,596
200	Contractual Service	114,130	64,376	-49,754
216	Maint. & Repair of Auto Equipment	13,000	13,353	353
231-1	Purchase of Power for Resale	805,500	786,500	-19,000
231-2	Service Charge for Transm. & Dist.	2,207,800	2,034,487	-173,313
251	Subsistence of Employees	9,000	12,030	3,030
265	Property Evaluation	20,000	15,144	-4,856
300	Material and Supplies	91,900	102,367	10,467
640	Water Rights and Damage Claims	24,000	11,241	-12,759
641	Hydrography	11,346	10,303	-1,043
801	Accident Compensation	12,000	22,663	10,663
812	Fidelity Insurance	53	53	-0-
813	Automobile Insurance	2,500	2,436	-64
814	Fire Insurance	9,567	9,567	-0-
815	Miscellaneous Insurance	10,000	9,824	-176
854	Membership Dues	2,771	2,265	-506
855	Fee to U. S. Gov't. - Raker Act.	30,000	30,000	-0-
856	Maint. Roads & Trails - Raker Act	25,000	12,500	-12,500
860	Retirement Allowance	75,458	74,913	-545
862	Social Security	42,955	35,397	-7,558
865	Health Service System	11,632	8,601	-3,031
870	Taxes	317,015	313,874	-3,141
880	Rentals - Transmission Lines, Offices	189,000	189,000	-0-
900	Services of Other Depts.	554,521	554,521	-0-
TOTAL OPERATION AND MAINTENANCE		<u>\$6,054,055</u>	<u>\$5,765,535</u>	<u>\$-288,520</u>
400	Equipment	90,269	85,884	-4,385
500	Additions and Betterments	231,715	231,715 *	-0-
700	Reconstruction and Replacement	608,035	608,035 **	-0-
800	Bond Interest and Redemption	9,483,047	9,575,728	92,681
TOTAL		<u><u>\$16,467,121</u></u>	<u><u>\$16,266,897</u></u>	<u><u>\$-200,224</u></u>

* Unexpended balance transferred to unallocated balance of appropriation.

** Includes expenditures, encumbrances, and unencumbered balance allocated for subsequent construction.

TABLE 2
HETCH HETCHY WATER AND POWER
SUMMARY OF RECEIPTS AND EXPENDITURES
FISCAL YEAR 1968-69

	<u>BUDGET</u>	<u>ACTUAL</u>	<u>-UNDER OVER</u>
<u>RECEIPTS</u>			
Revenue from Sale of Electric Energy	\$13,525,800	\$13,218,556	\$-307,244
Revenue from Sale of Water and Standby Charge, SFWD	2,500,000	2,500,000	-0-
Other Revenue	65,000	91,641	26,641
 Total Gross Revenue	 \$16,090,800	 \$15,810,197	 \$-280,603
Surplus from Prior Years	376,321	456,700	80,379
 Total Receipts	 <u>\$16,467,121</u>	 <u>\$16,266,897</u>	 <u>\$-200,224</u>
<u>EXPENDITURES</u>			
Total Expenditures (from Table 1)	<u>\$16,467,121</u>	<u>\$16,266,897</u>	<u>\$-200,224</u>

TABLE 3
HETCH HETCHY WATER AND POWER
PRECIPITATION, RUNOFF, STORAGE AND DELIVERY
AS OF JUNE 30 BY FISCAL YEARS

		<u>1964-65</u>	<u>1965-66</u>	<u>1966-67</u>	<u>1967-68</u>	<u>1968-69</u>
<u>SEASON PRECIPITATION (INCHES)</u>						
Hetch Hetchy	Normal	34.31	41.33	30.20	49.02	21.68
Lake Lloyd		47.52	60.16	33.28	66.69	30.80
Approx. Percent of Normal			125%	89%	145%	65%
<u>WATERSHED RUNOFF (ACRE-FT.) (a)</u>						
Hetch Hetchy	721,224	879,800	719,100	839,900	758,800	1,114,900
Lake Lloyd)	426,284	569,100	384,600	559,800	385,600	724,500
Lake Eleanor)						
Total	<u>1,147,508</u>	<u>1,448,900</u>	<u>1,103,700</u>	<u>1,409,700</u>	<u>1,144,400</u>	<u>1,839,400</u>
Approx. Percent of Normal		128%	97%	124%	100%	160%
<u>RESERVOIR STORAGE (ACRE-FT.) (a)</u>						
No-Spill Capacity						
Hetch Hetchy	360,360	318,089	344,322	316,010	293,680	349,575
Lake Lloyd	268,800	233,568	159,420	249,001	197,916	260,021
Lake Eleanor		27,100	26,339	6,025	26,339	24,286
Total	<u>656,260</u>	<u>577,796</u>	<u>509,767</u>	<u>591,350</u>	<u>517,935</u>	<u>633,882</u>
<u>DELIVERY TO SFWD (ACRE-FT.) (a) (b)</u>						
Average per day						
Maximum per day						
Total for fiscal year	168,405	169,875	208,821	185,342	205,425	

Total since operation of Hetch Hetchy Aqueduct began in 1934

3,255,317

NOTES: (a) One acre-foot equals 325,900 gallons or approximately 1/3 million gallons.
 (b) Includes delivery to Livermore site, U. S. Atomic Energy Commission.

TABLE 4
HETCH HETCHY WATER AND POWER

ELECTRIC ENERGY GENERATED, PURCHASED, AND DISTRIBUTED
FISCAL YEAR 1968-69

<u>PLANT DATA</u>	Nameplate Rating (Kilowatts)	Capability (Kilowatts)	Annual Plant Factor - %
Moccasin Powerhouse (New)	90,000	103,500	--
Dion R. Holm Powerhouse	135,000	150,000	72.0
Robert C. Kirkwood Powerhouse	67,500	85,000	80.5
Total	<u>292,500</u>		

ENERGY GENERATED AND PURCHASED (KILOWATT-HOURS)

Gross Generation

Moccasin Powerhouse (Old and New)	467,177,500	
Dion R. Holm Powerhouse	945,890,000	
Robert C. Kirkwood Powerhouse	<u>599,609,000</u>	2,012,682,500

Station Service

Moccasin Powerhouse (Old and New)	1,323,288	
Dion R. Holm Powerhouse	1,231,150	
Robert C. Kirkwood Powerhouse	<u>927,880</u>	3,482,318

Net Generation

		2,009,200,182
<u>Supplementary Energy</u>		
P.G.& E. Co. ("Bank" Withdrawal)	81,906,642	
P.G.& E. Co. (Purchase)	<u>40,798,879</u>	122,705,521
<u>Total</u>		<u>2,131,905,703</u>

ENERGY DISTRIBUTED (KILOWATT-HOURS)

Sales

Municipal Accounts	412,201,831	
Modesto Irrigation District	597,864,000	
Turlock Irrigation District	263,616,000	
Kaiser Cement & Gypsum Corporation	173,061,180	
Kaiser Aluminum and Chemical Corporation	30,744,000	
Norris Industries, Inc.	56,914,140	
Dow Chemical Company	23,582,132	
Hercules, Inc.	97,776,000	
California Ammonia Co.	101,720,736	
Air Products & Chemicals, Inc.	32,930,496	
Valley Nitrogen Producers, Inc.	28,675,920	
Miscellaneous Customers	1,016,562	

Non-Revenue

Project Use	3,787,748	
P.G.& E. Co. ("Bank" Deposit)	<u>205,895,527</u>	

Losses

Hetch Hetchy System	32,859,292	
P.G. & E. System (Municipal and Industrial Accounts)	<u>69,260,139</u>	

TABLE 5
HETCH HETCHY WATER AND POWER
COMPARATIVE ELECTRIC ENERGY SALES TO CUSTOMERS
FISCAL YEARS 1967-68 AND 1968-69
(Nearest 100,000 Kilowatt-hours)

<u>CUSTOMER</u>	<u>1967-68</u>	<u>1968-69</u>
Municipal Accounts		
International Airport	138,400,000	155,300,000
Municipal Transit System	67,100,000	67,400,000
Public Works	21,300,000	21,700,000
Street Lighting	41,200,000	41,900,000
Unified School District	26,200,000	28,500,000
Water Department	38,600,000	38,300,000
Other City Departments	56,000,000	59,100,000
Modesto Irrigation District	557,200,000	597,900,000
Turlock Irrigation District	248,500,000	263,600,000
Kaiser Cement & Gypsum Corp.	175,700,000	173,100,000
Kaiser Aluminum and Chemical Corp.	24,300,000	30,700,000
Norris Industries, Inc.	60,600,000	56,900,000
Dow Chemical Company	74,800,000	23,600,000
Hercules, Inc.	112,300,000	97,800,000
Shell Chemical Co.	50,600,000	0
California Ammonia Co.	100,800,000	101,700,000
Air Products & Chemicals, Inc.	20,800,000	32,900,000
Valley Nitrogen Producers, Inc.	0	28,700,000
All Other Sales	1,100,000	1,000,000
TOTAL	1,815,500,000	1,820,100,000

TABLE 6
HETCH HETCHY WATER AND POWER

COMPARATIVE GROSS REVENUE RECEIVED FROM SALE OF ELECTRIC ENERGY
FISCAL YEARS 1967-68 AND 1968-69
(Nearest \$1,000)

<u>CUSTOMER</u>	<u>1967-68</u>	<u>1968-69</u>
Municipal Accounts		
International Airport	\$ 1,136,000	\$ 1,278,000
Municipal Transit System	671,000	675,000
Public Works	261,000	269,000
Street Lighting	438,000	444,000
Unified School District	414,000	445,000
Water Department	352,000	350,000
Other City Departments	706,000	741,000
Modesto Irrigation District	2,966,000	3,477,000
Turlock Irrigation District	1,277,000	1,393,000
Kaiser Cement & Gypsum Corp.	1,355,000	1,338,000
Kaiser Aluminum and Chemical Corp.	226,000	262,000
Norris Industries, Inc.	592,000	581,000
Dow Chemical Company	516,000	178,000
Hercules, Inc.	766,000	661,000
Shell Chemical Co.	339,000	0
California Ammonia Co.	689,000	689,000
Air Products & Chemicals, Inc.	146,000	229,000
Valley Nitrogen Producers, Inc.	0	194,000
All Other Sales	18,000	16,000
TOTAL	\$12,868,000	\$13,220,000

TABLE 7

NET WATER AND POWER

ELECTRIC ENERGY GENERATED, PURCHASED, AND DISTRIBUTED BY FISCAL YEARS --- KILOWATT-HOURS

	1963-64	1964-65	1965-66	1966-67	1967-68	1968-69
<u>NET GENERATION</u>						
Noccasin Powerhouse	527,570,400	516,508,000	522,006,700	515,158,600	528,512,500	465,854,212
Dion R. Holm Powerhouse	972,596,880	758,213,880	918,704,430	789,570,220	735,220,320	944,664,850
Robert C. Kirkwood Pwrs.	---	---	---	210,829,330	613,159,620	598,681,120
Early Intake Powerhouse	4,395	8,600	0	3,000	0	---
Subtotal	1,500,171,675	1,274,750,480	1,440,711,130	1,515,561,150	1,874,892,440	2,009,200,182
<u>SUPPLEMENTARY ENERGY</u>						
P.G.&E. ("Bank" Withd.)	4,252,209	2,972,600	18,140,548	0	116,276,026	81,906,642
P.G.&E. (Purchase)	114,717,222	335,040,505	233,597,451	255,197,673	0	40,798,879
Subtotal	118,969,431	338,013,105	251,537,999	255,197,673	116,276,026	122,705,521
TOTAL	1,619,141,106	1,612,743,585	1,692,249,129	1,770,758,823	1,991,168,466	2,131,905,705
<u>DISTRIBUTION</u>						
<u>Sales</u>						
Municipal Accounts	293,160,152	315,641,672	358,564,327	361,956,735	388,836,371	412,201,831
Modesto Irrig. Dist.	386,283,000	415,564,800	454,291,800	512,112,000	557,184,000	597,864,000
Turlock Irrig. Dist.	151,771,700	141,799,500	173,064,904	206,568,000	248,457,600	263,616,000
Kaiser Cement & Gypsum	155,387,840	151,942,208	163,529,750	149,419,000	175,655,640	173,061,180
Kaiser Alum. & Chemical	14,496,000	15,998,280	16,968,000	24,600,324	24,334,411	30,744,000
Norris Industries, Inc.	---	---	---	27,262,886	60,637,939	56,914,140
Dow Chemical Co.	303,892,152	313,575,384	309,582,408	95,705,880	74,829,720	23,582,132
Hercules, Inc.	133,758,000	134,568,000	138,762,000	112,572,000	112,338,000	97,776,000
Shell Chemical Co.	66,618,000	---	---	50,346,000	50,570,000	---
California Ammonia Co.	---	---	---	18,992,040	100,845,672	101,720,736
Air Prod.& Chemicals, Inc.	---	---	---	---	20,762,304	32,930,496
Valley Nitrogen Prod., Inc.	---	---	---	---	---	28,675,920
Misc. Customers	12,406,416	3,674,179	1,294,252	1,045,156	1,046,804	1,016,562
<u>Non-Revenue</u>						
Project Use	3,627,929	3,309,842	3,306,403	3,716,688	3,468,127	3,787,748
P.G.&E. ("Bank" Dep.)	0	21,113,148	0	110,919,058	60,324,204	205,895,527
Losses	97,739,917	95,556,572	92,885,285	95,543,056	111,877,674	102,119,431
TOTAL	1,619,141,106	1,612,743,585	1,692,249,129	1,770,758,823	1,991,168,466	2,131,905,703

TABLE 8
BUREAU OF LIGHT, HEAT AND POWER

COMPARISON OF BUDGETED AND ACTUAL EXPENDITURES AND RECEIPTS
(INCLUDING ENCUMBRANCES)

FISCAL YEAR 1968-69

OE	DESCRIPTION	BUDGET	ACTUAL	-UNDER OVER
<u>EXPENDITURES</u>				
110	Permanent Salaries	\$ 127,874	\$ 125,093	\$ -2,781
111	Allowance for Overtime	600	538	-62
112	Holiday Pay	285	275	-10
200	Contractual Services	2,200	1,116	-1,084
231	Lighting and Heating of Public Buildings - General	1,036,090	1,006,412	-29,678
231-1	Lighting and Heating of Public Bldgs. - Special Funds	3,698,121	3,659,920	-38,201
231-2	Lighting of Public Streets - Pacific Gas and Electric Co.	633,053	617,954	-15,099
231-3	Lighting of Public Streets - Hetch Hetchy	429,647	433,711	4,064
231-4	Lighting of Public Streets - Calif. Division of Highways	850	850	-0-
300	Materials and Supplies	675	621	-54
400	Equipment	2,500	2,073	-427
813	Auto Insurance	300	252	-48
860	Retirement Allowance	6,370	6,370	-0-
862	Social Security	4,211	1,994	-2,217
865	Health Service System	1,828	1,709	-119
TOTAL		<u>\$5,944,604</u>	<u>\$5,858,888</u>	<u>\$-85,716</u>
<u>RECEIPTS</u>				
Interfund Receipts *		\$3,783,471	\$3,742,637	\$-40,834
Ad Valorem Taxes		2,161,133	2,116,251	-44,882
TOTAL		<u>\$5,944,604</u>	<u>\$5,858,888</u>	<u>\$-85,716</u>

WORK ORDER APPROPRIATIONS FROM ROAD FUND

DESCRIPTION	TOTAL FUNDS	EXPENDITURE	-UNDER OVER
Maintenance and Repair of Street Lighting Installations	\$125,000	\$124,593	\$-407

* Transfers from other departments.

TABLE 9
BUREAU OF LIGHT, HEAT AND POWER

EXPENDITURE FOR ELECTRICITY FOR MUNICIPAL PURPOSES
FISCAL YEAR 1968-69

DEPARTMENT	NO. OF ACCOUNTS	CONSUMPTION KILOWATT-HOURS	EXPENDITURE
Art Museum	1	607,068	\$ 7,356
Auditorium and Brooks Hall	1	4,223,800	46,880
Child Care Centers	9	106,385	2,674
City Planning	1	60,520	1,281
DeYoung Museum	1	2,564,000	23,990
Disaster Corps	2	2,141	92
Electricity	5	494,143	43,593
Farmers Market	1	9,344	239
Fire (a)	58	2,640,897	55,211
Hassler Health Home	1	725,400	8,170
Health	22	10,643,629	105,860
Hetch Hetchy	6	138,534	3,632
Hidden Valley Ranch	1	801,600	9,933
International Airport (Incl. resale)	9	155,328,590	1,278,121
Legion of Honor	2	357,714	5,203
Library	32	2,544,348	43,593
Log Cabin Ranch	13	362,100	9,730
Municipal Railway	41	67,362,015	675,469
Parking Authority	13	37,491	1,089
Police	16	620,931	13,174
Public Buildings	9	13,889,242	124,517
Public Works	62	21,464,658	263,666
Purchasing	6	457,509	7,184
Record Center	1	253	14
Recreation and Park	185	9,384,764	160,345
Recreation and Park - Yacht Harbor	34	975,736	21,746
Sheriff	3	1,288,503	13,367
Social Services	6	1,217,627	15,920
Street Lighting Operations	-	41,874,441	432,711
Unified School District	235	28,499,575	444,545
War Memorial	1	1,100,532	14,380
Water	113	38,338,039	349,486
Youth Guidance	1	1,479,600	15,219
 TOTAL MUNICIPAL DEPARTMENTS	891	409,601,129	\$4,198,390
Academy of Sciences	2	2,324,204	22,059
Mount Davidson Cross Lighting	-	(b)	1,000
State of Calif.: Street Lighting	1	(c)	11,647
Traffic Devices	1	276,498	5,466
 TOTAL FROM HETCH HETCHY	895	412,201,831	\$4,238,562
Fire Dept., For Resale to Fort Mason	1	2,482,574	29,987
 GRAND TOTAL	896	414,684,405	\$4,268,549

NOTES: (a) Electricity purchased for resale to Fort Mason excluded.

(b) Included under Recreation and Park.

(c) Included under Street Lighting Operations.

TABLE 10
BUREAU OF LIGHT, HEAT AND POWER

EXPENDITURE FOR GAS AND STEAM FOR MUNICIPAL PURPOSES
FISCAL YEAR 1968-69

NATURAL GAS

<u>DEPARTMENT</u>	<u>NO. OF ACCOUNTS</u>	<u>CONSUMPTION THERMS</u>	<u>EXPENDITURE</u>
Auditorium and Brooks Hall	2	6,298	\$ 61
Child Care Centers	8	28,542	1,789
City Planning	1	6,298	383
DeYoung Museum	1	290,626	16,689
Disaster Corps	1	237	27
Electricity	2	50,237	2,929
Farmers Market	1	750	58
Fire	59	704,740	40,706
Hassler Health Home	3	287,589	16,818
Health	20	4,201,839	183,327
Hetch Hetchy	2	2,163	186
International Airport	9	1,574,874	71,953
Library	29	106,548	6,632
Municipal Railway	13	272,556	15,828
Police	9	57,664	3,501
Public Buildings	4	1,420,743	66,278
Public Works	11	359,882	23,134
Purchasing	3	73,869	4,153
Recreation and Park	103	1,417,679	82,863
Registrar of Voters	1	13,539	800
Sheriff	2	413,278	19,798
Single Men's Rehabilitation Center	1	32,161	1,909
Social Services	4	72,933	4,267
Unified School District	209	4,916,585	276,339
War Memorial	3	250,031	14,380
Water	11	125,704	7,520
Youth Guidance	2	466,100	22,157
<hr/>			
TOTAL MUNICIPAL DEPARTMENTS	514	17,153,465	\$884,485
Academy of Sciences	2	304,194	11,483
<hr/>			
GRAND TOTAL	<u><u>516</u></u>	<u><u>17,457,659</u></u>	<u><u>\$895,968</u></u>

STEAM

(Does not include steam generated by City)

<u>DEPARTMENT</u>	<u>NO. OF ACCOUNTS</u>	<u>CONSUMPTION POUNDS</u>	<u>EXPENDITURE</u>
Social Services	1	2,219,800	\$ 4,378

TABLE 11
BUREAU OF LIGHT, HEAT AND POWER

STREET LIGHTS IN SERVICE
JUNE 30, 1969

<u>SIZE & TYPE OF LAMP</u>	<u>COMPANY-OWNED</u>	<u>JOINTLY-OWNED</u>	<u>CITY-OWNED</u>	<u>TOTAL</u>
<u>UNDERGROUND CONNECTED</u>				
<u>High Voltage Series Circuit</u>				
1,000-Lumen Incandescent	--	22	--	22
2,500 "	297	26	279	602
4,000 "	1,725	392	2,177	4,294
6,000 "	769	532	4,153	5,454
10,000 "	406	18	586	1,010
23,000 " Fluorescent	3	--	7	10
400-Watt Mercury Vapor	6	43	144	193
1,000 "	--	--	3	3
<u>Low Voltage Multiple Circuit</u>				
1,000-Lumen Incandescent	--	--	122	122
2,500 "	15	4	69	88
4,000 "	259	3	82	344
6,000 "	84	9	119	212
10,000 "	4	--	9	13
5,500 " Fluorescent	--	--	25	25
23,000 "	38	--	95	133
100-Watt Mercury Vapor	--	--	58	58
175 "	26	--	1,138	1,164
250 "	33	--	326	359
400 "	680	--	2,287	2,967
700 "	--	--	149	149
1,000 "	--	--	143	143
<u>OVERHEAD CONNECTED</u>				
<u>High Voltage Series Circuit</u>				
2,500-Lumen Incandescent	7	--	--	7
4,000 "	63	--	42	105
6,000 "	11	--	1	12
<u>Low Voltage Multiple Circuit</u>				
2,500-Lumen Incandescent	23	--	--	23
4,000 "	65	--	11	76
6,000 "	6	--	--	6
175-Watt Mercury Vapor	15,173	--	--	15,173
250 "	1,990	--	--	1,990
400 "	820	--	--	820
TOTAL, JUNE 30, 1969	22,503	1,049	12,025	35,577
	63.25%	2.95%	33.80%	100%
TOTAL, JUNE 30, 1968	22,728	1,140	11,691	35,559
NET CHANGE DURING THE YEAR	-225	-91	+334	+18

TABLE 12
BUREAU OF LIGHT, HEAT AND POWER

EXPENDITURES FOR OPERATION AND MAINTENANCE OF STREET LIGHTING
FISCAL YEAR 1968-69

CONTRACTUAL SERVICE

P. G. & E. Company

Company-owned facilities (a)	\$874,812
Jointly-owned facilities (a)	49,139
City-owned facilities (b)	165,616
Emergency service to City-owned facilities	6,800
Less deduction for energy component	<u>471,613</u>
	\$ 624,754

Lease-Lite Corporation

Group lamp replacement - City-owned facilities	39,344
--	--------

Lease-Lite Corporation

Maintenance and repair - City-owned facilities	
Routine maintenance	22,617
Repair of damage caused by accidents (c)	27,813
Repair of damage caused by equipment failure	<u>12,331</u>
	62,761

MATERIAL AND SUPPLIES (FURNISHED BY CITY)

Damage caused by accidents (c)	8,204
Damage caused by equipment failure	<u>4,247</u>
	12,451

ELECTRIC ENERGY (HETCH HETCHY)

41,874,441 kWh @ \$0.01345 less 21% discount	<u>444,937</u>
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TOTAL EXPENDITURE	\$1,184,247
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LESS AMOUNT PAID TO HETCH HETCHY FROM:

Gas Tax Funds for State Highway routes	11,647
Recreation and Park Dept. for off-street lighting	<u>579</u>
	<u>12,226</u>
TOTAL NET EXPENDITURE	<u>\$1,172,021</u>

AVERAGE OPERATING COST

Based on number of lights in service June 30, 1969, average total cost of operation, maintenance and repair per light per year:	<u>\$32.94</u>
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NOTES: (a) Includes maintenance, repair, fixed charges and electric energy for Company-owned facilities.

(b) Includes replacement of individual lamps and broken glassware, service and switching charges, and electric energy.

(c) When responsible party is known, claim is filed for recovery of costs. (See Table 13.)

TABLE 13
BUREAU OF LIGHT, HEAT AND POWER
ACCIDENT DAMAGE TO CITY-OWNED STREET LIGHTING
BY FISCAL YEARS

	1965-66	1966-67	1967-68	1968-69
Number of Accidents	94	88	122	140
Cost of Damage Repairs (a)	\$38,508	\$31,117	\$49,616	\$50,069 (b)
Average Cost Per Accident	355	354	407	358 (b)
Amount Billed Responsible Parties (c)	25,052	26,724	51,818	35,209
Amount Collected:				
By Bureau of Light, Heat and Power	10,566	11,393	19,577	14,686
By Bureau of Delinquent Revenue (d) (e)	11,237	7,500	12,580	15,874
Amount Abandoned (Uncollectible)	15,430	10,068	16,016	12,883
Amount Receivable June 30:				
Payable to Bureau of Light, Heat and Power	12,553	13,231	19,879	21,217
Payable to Bureau of Delinquent Revenue (e)	38,762	35,856	34,380	41,292

NOTES: (a) Includes administrative expense.

(b) Includes estimated cost of uncompleted work as of June 30, 1969.

(c) Includes only cases of current and previous year for which work was completed during the year.

(d) Includes installment payments on cases from previous years.

(e) Accounts are transferred to Bureau of Delinquent Revenue when:

1. Account is over 90 days old;

2. Installment payments are made;

3. Liability is denied;

4. Responsible party is deceased or his whereabouts unknown.

TABLE 14
BUREAU OF LIGHT, HEAT AND POWER

NEW CITY-OWNED STREET LIGHTING INSTALLATIONS
COMPLETED DURING FISCAL YEAR 1968-69

<u>Location</u>	<u>No. of Lights</u>	<u>Type of Light (a)</u>	<u>Value</u>
Financed by 1964 Street Lighting Bonds:			
Bay St., Fillmore to Columbus	76	M	\$ 74,278
California St. at Webster	4	M	2,000
Geneva Ave., Mission to Santos	136	M	72,076
Haight St., Masonic to Stanyan	21	L	3,500
Pacific Ave., Van Ness to Kearny	79	M	55,740
Scott St., Hayes to Duboce	28	M	24,977
Sloat Blvd. and Vicinity	404	M	<u>384,151</u>
TOTAL	748		\$616,722
Financed by State Gasoline Tax:			
Bosworth Widening, Contract #3	28	M	\$ 28,770
Downtown Area, Contract #2	206	M	192,883
Fisherman's Wharf Area, Stage II	26	M	23,929
Geneva Ave., Tara to Ocean	18	M	18,989
Green St., Russian Hill	13	M	8,190
Indiana St., Mariposa to 20th St.	11	M	11,971
Lincoln Way, Funston to 20th Ave.	20	M	39,754
Lincoln Way, 5th to 8th Aves.	18	M	15,515
Redevelopment Area E-1, Cont. G	4	M	2,000
Redevelopment Area E-1, Cont. H	10	M	7,623
Redevelopment Area E-1, Cont. I	1	M	1,160
Stanyan St., Fulton to Fell	17	M	19,000
7th St., Market to McAllister	5	M	<u>4,445</u>
TOTAL	377		\$374,229
Financed by Division of Highways:			
Army and Pennsylvania Sts.	2	M	1,200
Faith St. Overcrossing	11	M	9,900
18th St. Overcrossing	12	M,F	3,300
18th St., Pennsylvania to Minnesota	9	M	10,800
20th St., Pennsylvania to Minnesota	9	M	9,600
22nd St., Pennsylvania to Indiana	3	M	1,800
23rd St., Pennsylvania to Indiana	3	M	2,250
25th St., Iowa to Indiana	2	M	<u>1,400</u>
TOTAL	51		\$ 40,250
GRAND TOTAL	<u>1,176</u>		<u>\$1,031,201</u>

NOTES: (a) F - Fluorescent
L - Lucalox
M - Mercury

TABLE 15
BUREAU OF LIGHT, HEAT AND POWER

HISTORICAL COST OF CITY-OWNED STREET LIGHTING IMPROVEMENTS

Fiscal Year	Ad Valorem Taxes	Gasoline Taxes	Street Lighting Bonds	Property Owners	State Highway Dept.	Miscellaneous Sources*	Total
Prior to July 1, 1952	\$1,497,585	\$ 397,159	-	\$544,626	\$ 22,650	\$477,146	\$2,939,166
1952-53	251,090	219,956	-	31,778	-	505	503,329
1953-54	142,151	22,181	-	23,495	2,274	1,239	191,340
1954-55	115,727	30,817	-	748	16,578	543	164,413
1955-56	15,704	48,620	-	2,484	19,181	1,360	87,349
1956-57	114,168	26,641	-	7,256	-	3,003	151,068
1957-58	2,501	64,942	-	18,199	4,142	-	89,784
1958-59	-	171,367	-	10,231	626	538	182,762
1959-60	-	100,126	-	35,874	10,242	4,083	150,325
1960-61	-	82,074	-	19,236	-	1,865	103,175
1961-62	-	200,113	-	116,376	24,550	7,993	349,032
1962-63	-	84,328	-	21,700	-	-	106,028
1963-64	-	340,108	-	32,556	6,000	-	378,664
1964-65	-	97,846	-	8,975	50,857	-	157,678
1965-66	-	474,673	\$522,899	-	-	-	997,572
1966-67	-	111,164	188,312	5,000	-	-	304,476
1967-68	-	175,949	331,941	-	-	-	507,890
1968-69	-	374,229	616,722	-	40,250	-	1,031,201
TOTAL	\$2,138,926	\$3,022,293	\$1,659,874	\$878,534	\$197,350	\$498,275	\$8,395,252
LESS:							
Cost of portions removed prior to fiscal year 1968-69							505,730
Cost of portions removed during fiscal year 1968-69							<u>289,624</u>
Original Cost of City-owned Facilities in service June 30, 1969							<u>795,354</u>
							<u>\$7,599,898</u>

* Includes WPA & PWA (1935-1942), Boulevard Construction (1932-1934), Municipal Transit System, Park and Recreation, and Housing Authority.

TABLE 16
HETCH HETCHY WATER AND POWER
CONSTRUCTION CONTRACTS
FISCAL YEAR 1968-69

<u>Contract No.</u>	<u>Description</u>	<u>Contractor</u>	<u>Contract Started</u>	<u>Time Completed</u>	<u>Original Contract Price</u>	<u>Value of Work Done During Fiscal Year</u>
HH-376	Canyon Powerhouse Replacement	Peter Kiewit Sons' Co.	11-2-64	----	\$4,293,439	\$ No payments made
HH-382	Moccasin Powerhouse Replacement	Halvorson-McLaughlin Constructors	2-27-67	4-30-69	4,096,515	1,036,837
HH-386	Alterations to Tesla Portal in the San Joaquin Division of the Hetch Hetchy Aqueduct	S & Q Construction	8-14-67	7-29-68	300,133	4,950
HH-393	Warnerville Substation Addition	Abbett Electric Corporation	-	10-7-68	----	221,211
HH-396	Replacement of Diversion Conduit Liner Moccasin Reservoir	Valentine Corporation	7-15-68	9-17-68	57,944	57,895
HH-400	Improvements to Gaging Station Below O'Shaughnessy Dam	Valentine Corporation	9-23-68	2-4-69	29,345	30,497
HH-402	Repaving Cherry Access Road - Jones Point to Cherry River Bridge	George Reed, Inc.	12-4-67	7-16-68	83,688	9,123
HH-407	Replacement of Electric Distribution System O'Shaughnessy Dam Area	Overhead Electric Co.	9-2-68	----	74,725	44,133

(Continued)

TABLE 16 - (Cont'd)
HETCH HETCHY WATER AND POWER

CONSTRUCTION CONTRACTS
FISCAL YEAR 1968-69

<u>Contract No.</u>	<u>Description</u>	<u>Contractor</u>	<u>Contract Started</u>	<u>Time Completed</u>	<u>Original Contract Price</u>	<u>Value of Work Done During Fiscal Year</u>
III-408	Autotransformer Foundation Warrenville Substation	Brower Bros.	7-22-68	8-15-68	\$ 6,059	\$ 6,376
III-409	Pave Access Road Tesla Portal	Stanfield and Moody	10-21-68	11-22-68	8,338	7,301
III-416	Repave and Widen Cherry Access Road	George Reed, Inc.	6-30-69	----	117,951	67,445
III-418	Access Road Connection at Kirkwood Powerhouse	George Reed, Inc.	6-2-69	----	39,880	31,661
III-419	Noccasin-Newark Transmission Line • Replacement of Dead- End Clamps (Towers 443-N to 732-N)	Hetch Hetchy Water and Power	4-28-69	----	43,823	21,916
	Emergency Slide Removal Cherry Access Road	A. L. Craft	3-18-69	5-5-69	39,860	48,227
	Emergency Repair Generator No. 1	Hetch Hetchy Water and Power	5-23-69	----	75,000	17,516
						\$1,572,618
						Total Amount of Hetch Hetchy Contract Construction Work Performed During Fiscal Year

TABLE 16
WETCH METCHY WATER AND POWER
PURCHASE ORDERS FOR EQUIPMENT
FISCAL YEAR 1968-69

<u>Purchase Order No.</u>	<u>Description</u>	<u>Contractor</u>	<u>Contract Time Complicated</u>	<u>Original Contract Price</u>	<u>Value of Work Done During Fiscal Year</u>
75695	Oil Circuit Breakers for Warnerville Substation	I. T. E. Circuit Breaker Co.	2-20-68 -----	\$ 188,297	\$161,458
97984	Hydraulic Impulse Turbines for Moccasin Powerhouse	Hitachi New York, Ltd.	3-11-65 -----	1,211,402	14,700
R-70155	Synchronous Generators for Moccasin Powerhouse	Ferrostaal Pacific Corporation	1-18-66 -----	807,266	149,745
R-63758	Synchronous Generators for Moccasin Powerhouse	Ferrostaal Pacific Corporation	1-18-66 -----	1,050	0
R-20968	Power Transformers for Moccasin Powerhouse	Toshiba International Corporation	10-14-66 -----	346,263	59,773
26820	Gantry Crane for Moccasin Powerhouse	Mitsui & Company (U.S.A.), Inc.	12-16-66 -----	164,229	1,650
40800	Transformer for Warnerville Substation	C. Itoh & Co. (America), Inc.	4-25-67 -----	168,465	152,231
42626	18-Inch Butterfly Valve for Canyon Tunnel Drain Line	Mitsui & Company (U.S.A.), Inc.	5-23-67 -----	1,763	1,500
45219	Oil Circuit Breakers for Moccasin Powerhouse	McGraw - Edison	6-28-67 4-24-69	192,894	37,279
65392	Oil Circuit Breakers for Moccasin Powerhouse	McGraw - Edison	6-28-67 4-24-69	1,484	1,484
Total Amount of Work Done Under Hetch Hetchy Purchase Orders During Fiscal Year					
					\$579,820

1970

ANNUAL REPORT

1971

HETCH HETCHY WATER AND POWER

DOCUMENTS

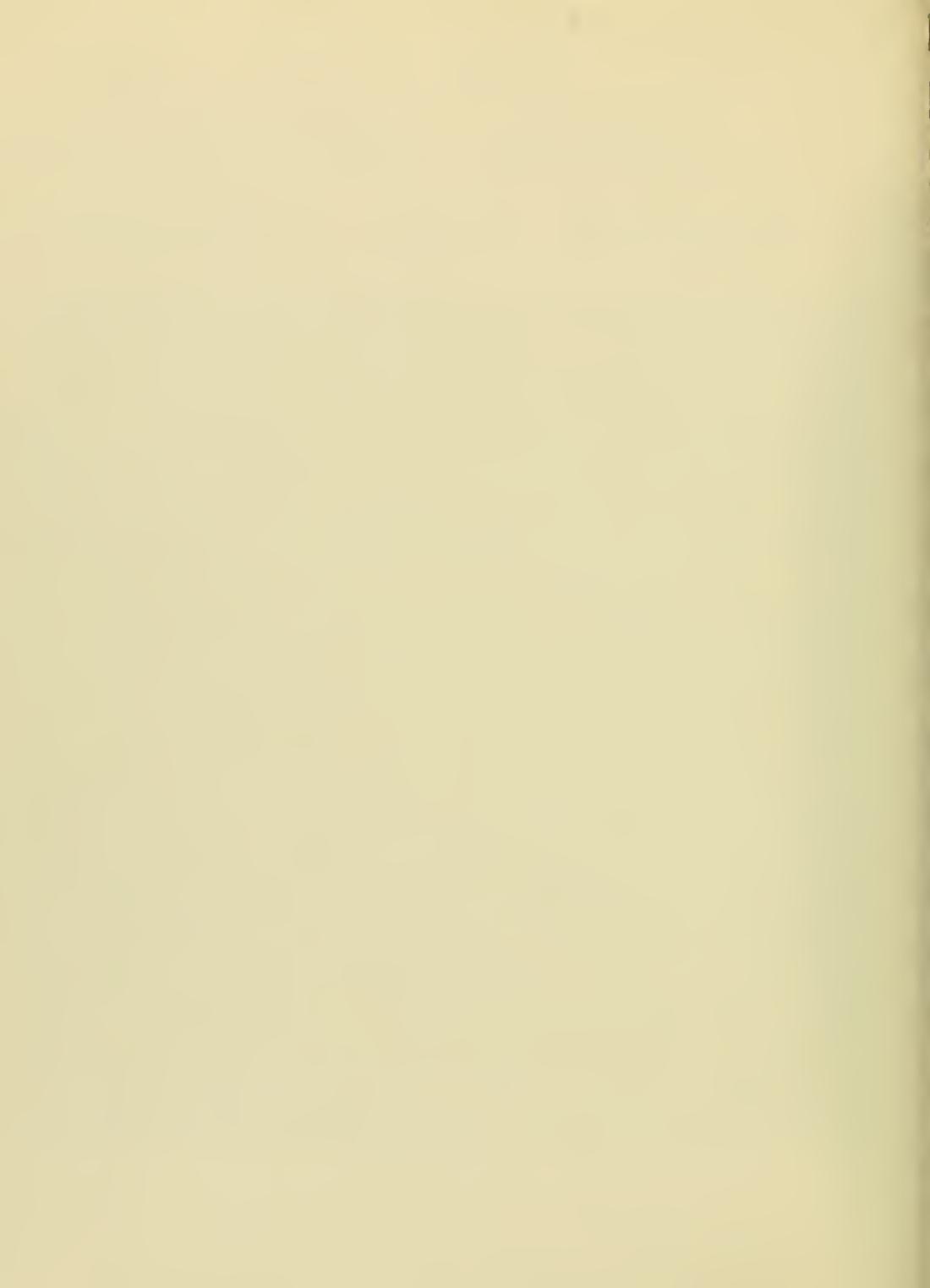
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DON PEDRO DAM

PUBLIC UTILITIES COMMISSION
CITY AND COUNTY OF SAN FRANCISCO



CITY AND COUNTY OF SAN FRANCISCO

JOSEPH L. ALIOTO - MAYOR

PUBLIC UTILITIES COMMISSION

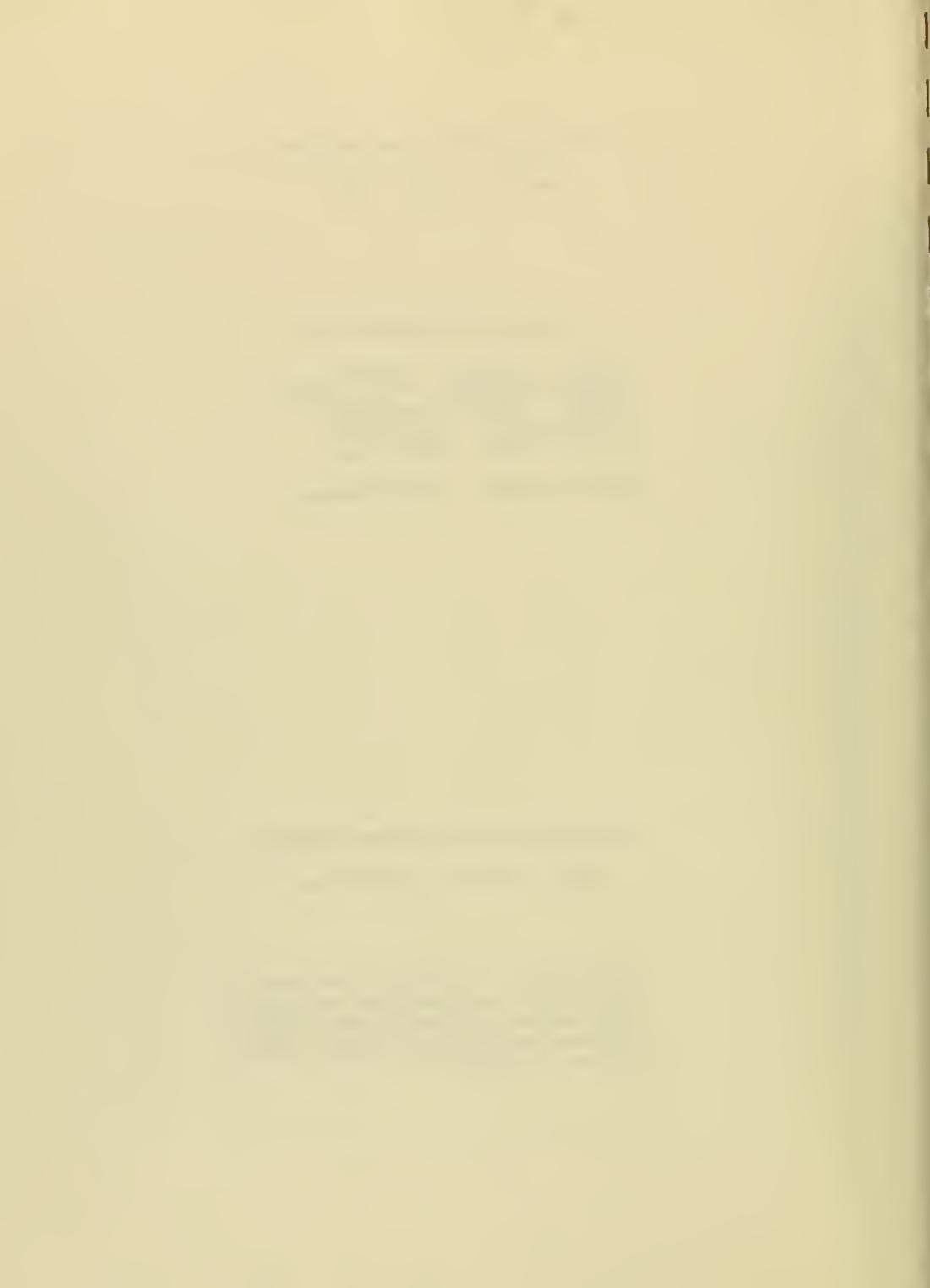
MARVIN E. CARDOZA - President
OLIVER M. ROUSSEAU - Vice President
JOSEPH J. DIVINY - Commissioner
H. WELTON FLYNN - Commissioner
LOUIS A. PETRI - Commissioner

JOHN D. CROWLEY - General Manager

HETCH HETCHY WATER AND POWER DEPARTMENT

ORAL L. MOORE - General Manager

This report is respectfully dedicated to
Hetch Hetchy employees, past and present,
whose devoted and conscientious efforts
have made possible these accomplishments
for San Francisco.





Wapama Falls
Hetch Hetchy Reservoir

Hetch Hetchy furnished power for the Muni and all other Municipal purposes at rates 21% below those which would have been charged by the Pacific Gas and Electric Company, a further saving to the taxpayers of about \$915,000 (See p.4).

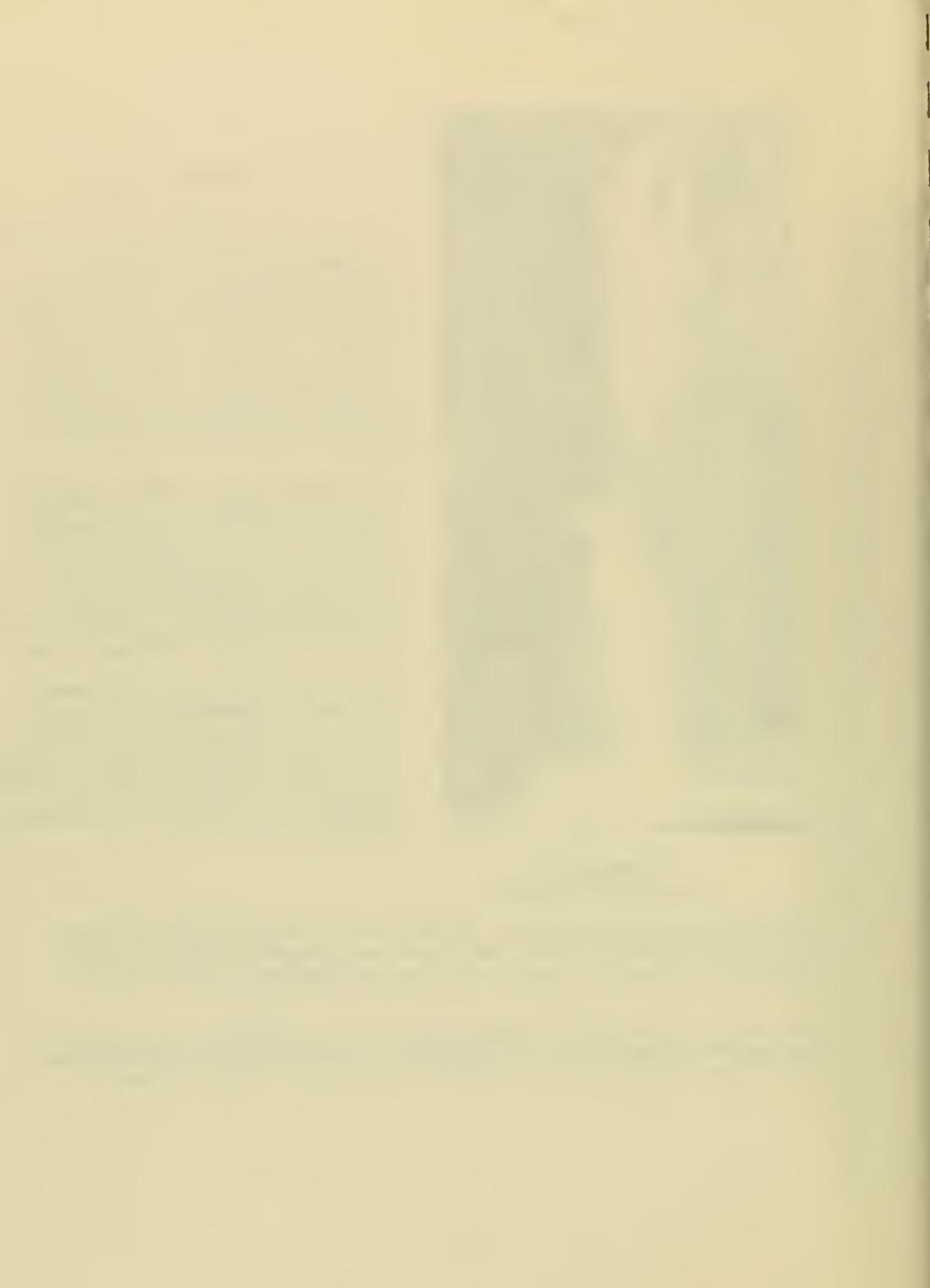
The rate of street lighting improvement hit an all-time high, as replacements maintained and operated by the Department were installed at a cost exceeding \$2 million. San Francisco is rapidly becoming truly a "City of light".

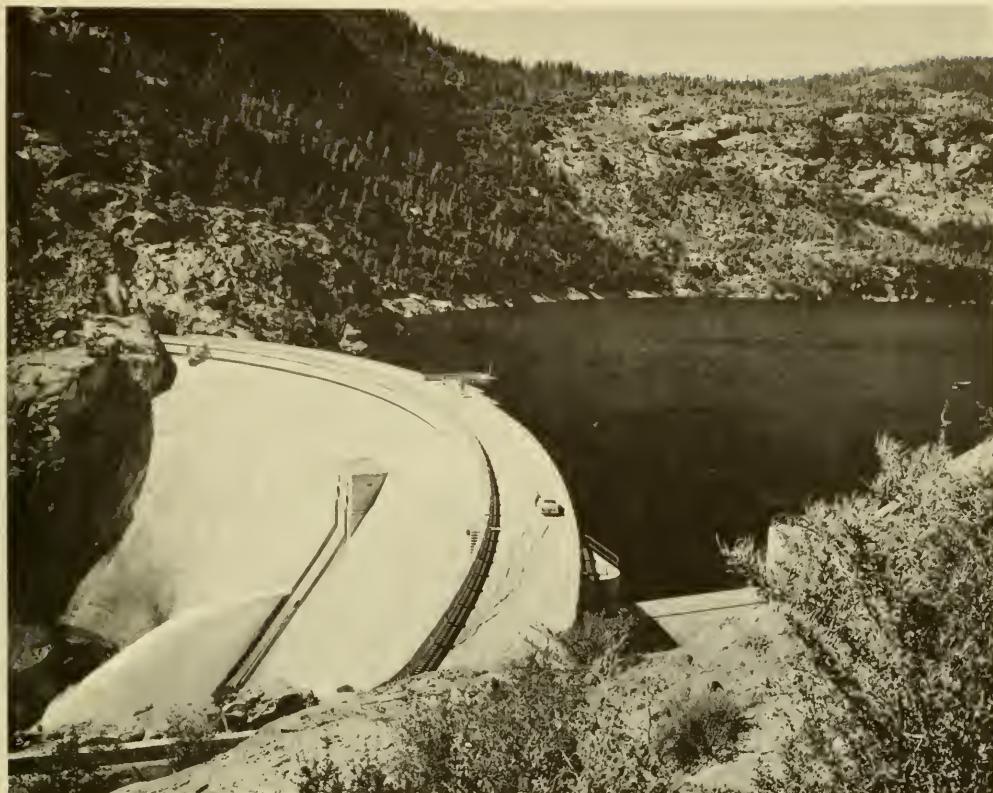
HIGHLIGHTS - 1970-71

On May 22, 1971, Mayor Alioto dedicated the new Don Pedro Dam (cover), a cooperative project constructed by Hetch Hetchy and the Turlock and Modesto Irrigation Districts on the Tuolumne River. This Dam, the second highest in California, just about doubles the water available for distribution by the San Francisco Water Department from the Hetch Hetchy System; from 220 to 400 million gallons daily.

Hetch Hetchy power revenues continued to climb, reaching an all-time high of \$14,981,938.14. This is probably as much as the system will earn with the present generating facilities. Net operating revenues from power sales dropped slightly to \$6.4 million, as operating expenses, principally wages and salaries, continue to rise.

\$2.17 million in Hetch Hetchy power revenues were appropriated this year for the operation, maintenance and improvement of the electrical facilities of the San Francisco Municipal Railway, thus sparing City taxpayers the paying of this amount as an additional subsidy.



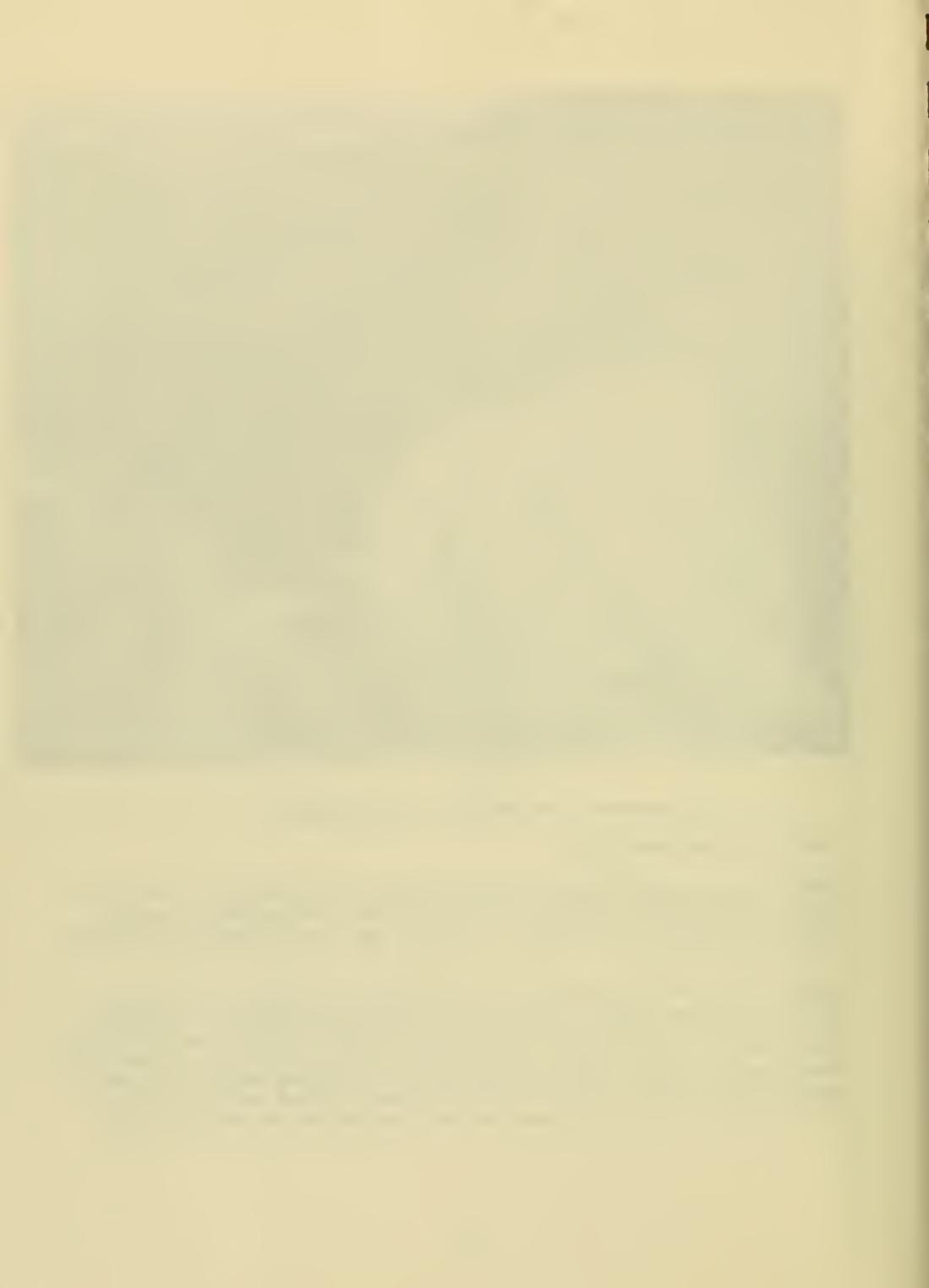


O'Shaughnessy Dam and Hetch Hetchy Reservoir

ORGANIZATION AND FUNCTIONS

Under policies established by the San Francisco Public Utilities Commission, HETCH HETCHY WATER AND POWER and BUREAU OF LIGHT, HEAT AND POWER serve the City and County of San Francisco in the dual function of operating department and service bureau.

Hetch Hetchy Water and Power is a municipally-owned system of storage reservoirs and aqueducts which collects water from the Tuolumne River watershed and delivers it to the San Francisco Water Department. Approximately three-fourths of the water consumed in San Francisco and the Water Department service area comes from this source. As a by-product of falling water, Hetch Hetchy operates and maintains hydroelectric generating stations and high voltage transmission lines for the production and distribution of electric energy.



Through its Transit Power Division, Hetch Hetchy has operated, maintained and provided improvements for the electric facilities of the San Francisco Municipal Transit System since July 1, 1969. At that time, the Public Utilities Commission decided to transfer the responsibility for the conversion and distribution of electrical power to streetcars and trolley buses in San Francisco from the Municipal Transit System to Hetch Hetchy Water and Power. Now, Hetch Hetchy not only generates and transmits the electrical power from the Sierra Nevada to the Bay Area, as it has in the past, but distributes this power directly to the transit vehicle.

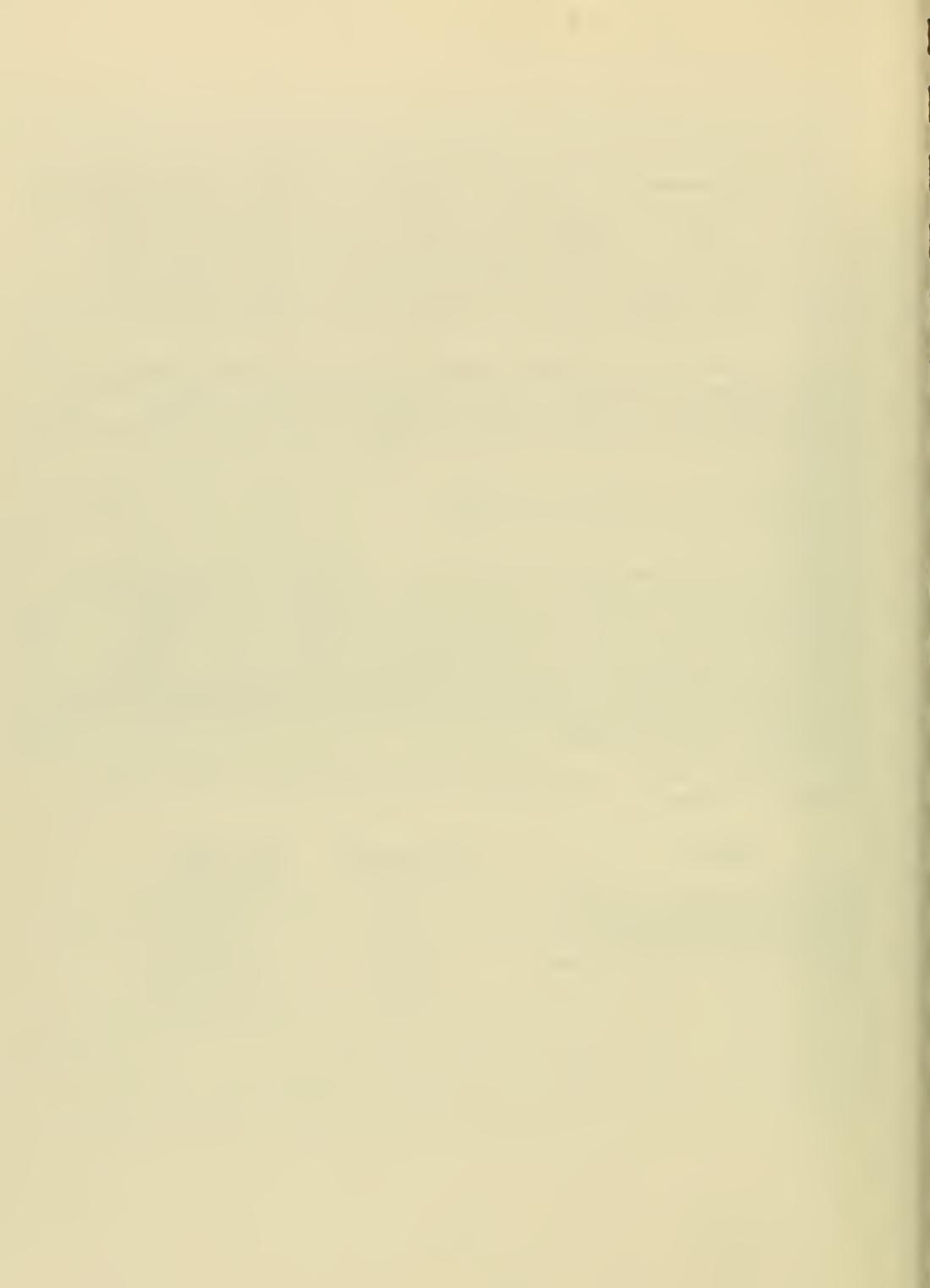
In order to handle this additional responsibility, Hetch Hetchy assumed control of the equipment and personnel of the Overhead Lines and Motive Power Sections of the Municipal Transit System. Personnel for this division includes fifty-one employees in twelve different categories. Last year this responsibility cost Hetch Hetchy, and saved San Francisco taxpayers, \$2.17 million.

All of Hetch Hetchy's expenses, including those of the Transit Power Division, are supported by water and power revenues.

The Bureau of Light, Heat and Power administers contracts for furnishing electric, gas and steam services to municipal departments and handles monthly billings. It also administers contracts for furnishing street lighting services and for operation and maintenance of City-owned street lighting. Financing, design, and construction of City-owned street lighting improvements are under the jurisdiction of Department of Public Works. In accordance with provisions of the City and County Administrative Code, plans for these improvements must be approved by the Public Utilities Commission through this bureau. The bureau is financed by appropriations from municipal departments and gas tax funds.

For fiscal year 1970-71, the Department administered budgeted funds for all purposes as follows:

<u>Budget</u>	<u>No. of Employees</u>	<u>Total Amount Appropriated</u>
Hetch Hetchy Water and Power	194	\$ 16,922,725
Hetch Hetchy Water and Power (Transit Power Division)	51	2,172,325
Bureau of Light, Heat and Power	<u>12</u>	<u>6,477,334</u>
	257	\$ 25,572.384



HETCH HETCHY WATER AND POWER SYSTEM

REVENUES AND EXPENDITURES

Revenue from Hetch Hetchy Water and Power operations is derived principally from two sources:

1. Sale of electric power and energy to San Francisco Municipal departments, Modesto and Turlock Irrigation Districts in the San Joaquin Valley, and seven industrial customers:

Kaiser Cement and Gypsum Corporation	Santa Clara County
Kaiser Aluminum and Chemical Corporation	Santa Clara County
Hercules, Inc.	Contra Costa County
California Ammonia Company	San Joaquin County
Air Products and Chemicals	San Joaquin County
Valley Nitrogen Producers	Fresno County
Morris Industries, Riverbank	Stanislaus County

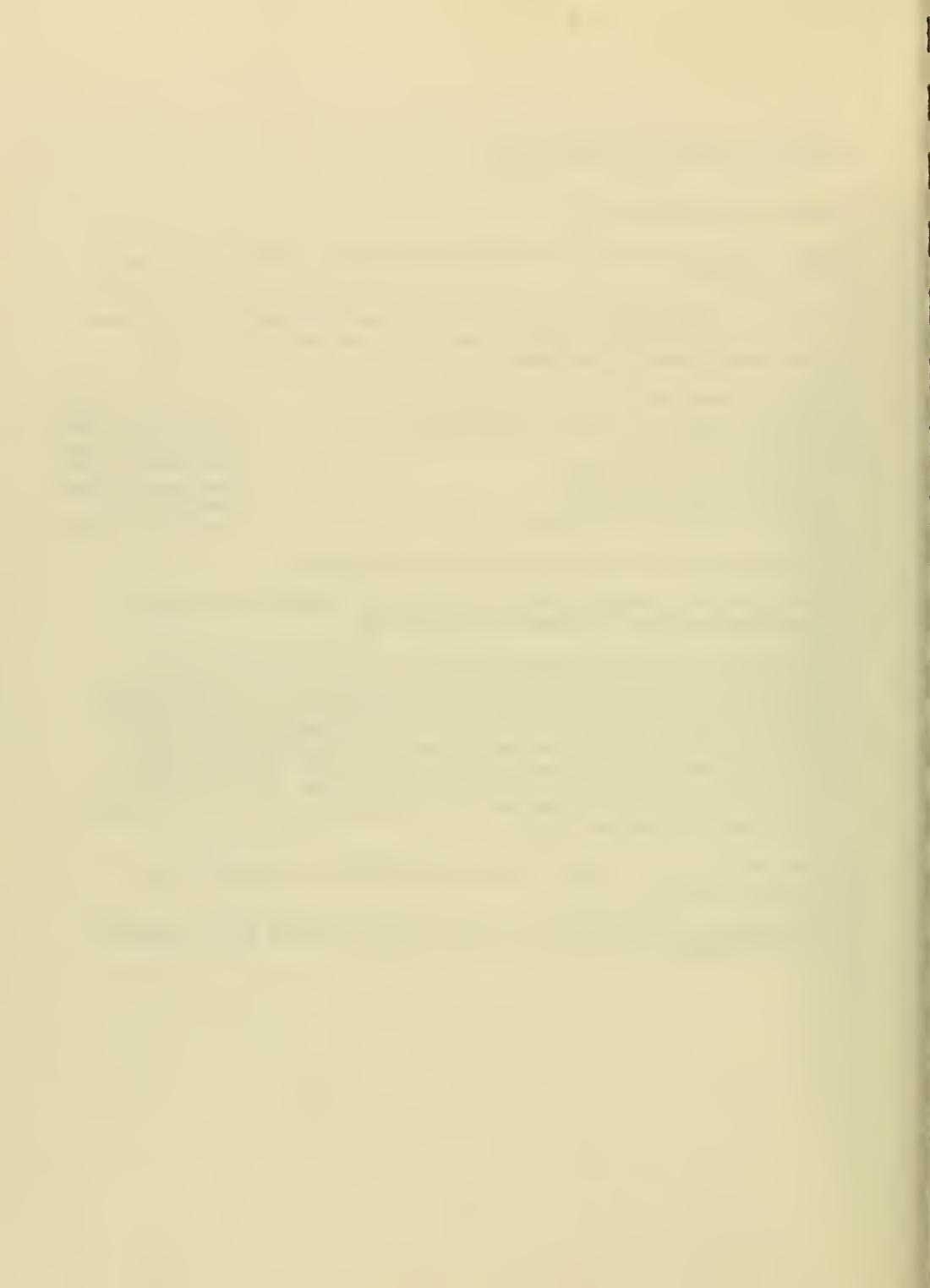
2. Sale of Water to the San Francisco Water Department.

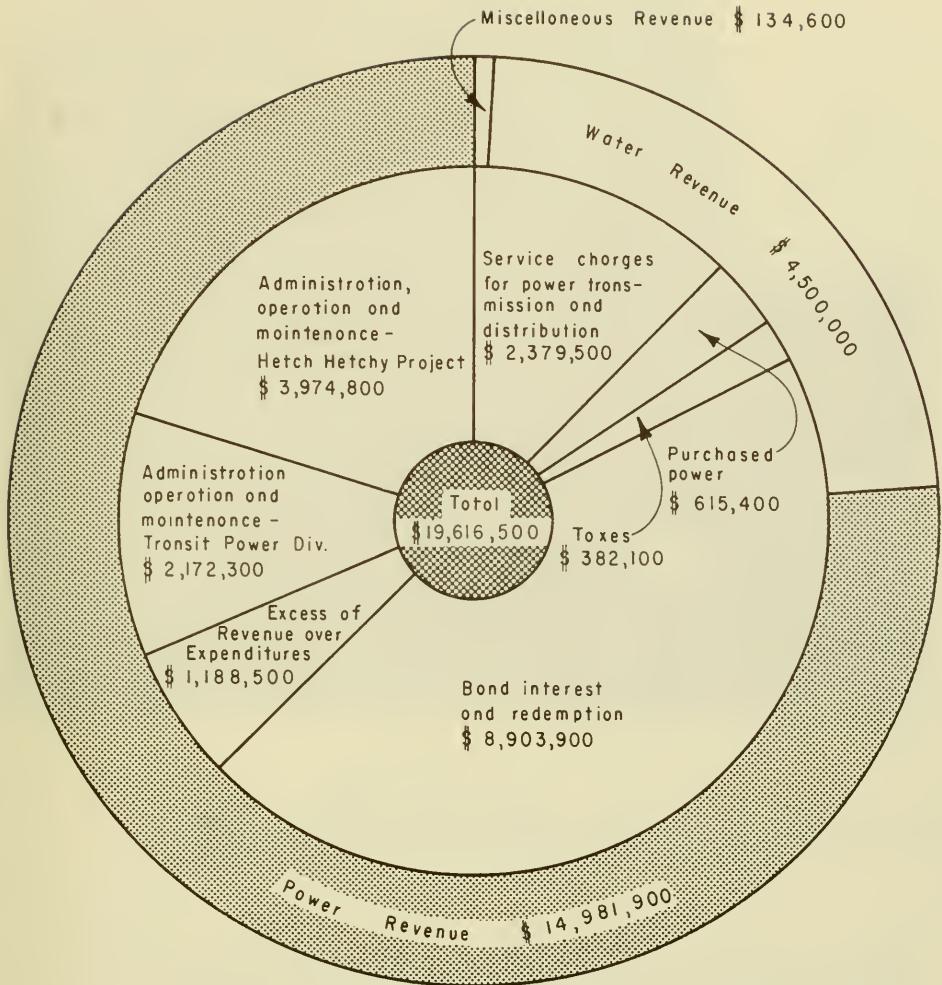
This past year, revenue from sale of water and standby service to the San Francisco Water Department was \$4,500,000.

Gross sales of electric energy amounted to \$14,981,938, compared to \$14,090,231 during the year 1969-70. This increase in electric revenue reflected the increase in actual sales during the year; 2,065,245,950 kilowatthours, as compared to 1,935,944,152 kilowatthours for 1969-70. This was made possible by maximum generation during the 1970 spring runoff period, reflecting an excellent water yield. The large surplus of electric energy delivered to the Pacific Gas and Electric Company during this period was withdrawn in the ensuing months, as it was needed to sustain the customer loads.

Revenue for service orders, rentals, meals and miscellaneous items totaled \$134,544.

Expenditures are summarized on the pie chart following and are detailed in the appendix.





HETCH HETCHY REVENUES
AND EXPENDITURES
FISCAL YEAR 1970-71



Moccasin Powerhouse

1. Dick Adler, Electrical Maintenance and Operations Superintendent
2. Bob Stein, Superintendent of Operations

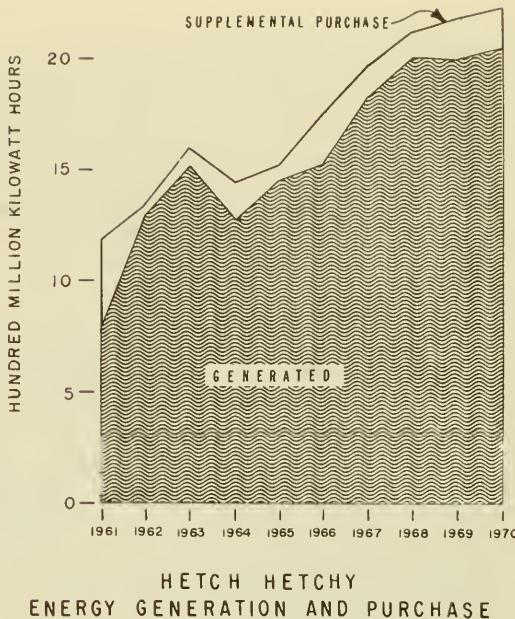
POWER SALES

Power and energy delivered to all City Departments collectively increased by 7.3% (See Appendix, Table 12). Individually, the changes in consumption among the departments varied between a decrease of 3.4% for the Municipal Railway on one hand, and an increase of 14.1% for the San Francisco International Airport on the other. Hetch Hetchy power is sold to City Departments at cost, representing a saving to taxpayers for 1970-71 of approximately \$915,000, compared to the cost if supplied by the local investor-owned utility.

Power and energy delivered to Modesto Irrigation District and Turlock Irrigation District increased by 14.2 and 18.6 per cent, respectively, this year. The tremendous increase is partially the result of steady

load growths experienced by these two Irrigation Districts. Also, the old Don Pedro power plant was shut down on October 15, 1970, to allow salvage operations to take place before the impounded water behind the new dam flooded the old power plant. During the interim between shutdown of the old plant and actual commercial operation of the new, the two Districts purchased all of their power requirements from City.

Since 1940, the Modesto and Turlock Irrigation Districts and the City and County of San Francisco have been cooperating in the further development of the water resources of the Tuolumne River Basin. Under the terms of the 1949 agreement, known as the "Third Agreement", the two Districts applied a \$4,600,000 Federal flood control grant to the construction of Cherry Valley Dam, and for this contribution the two Districts were permitted to purchase at cost a total of 35 percent of the firm generating capacity of City's Dion R. Holm (Cherry) Powerhouse

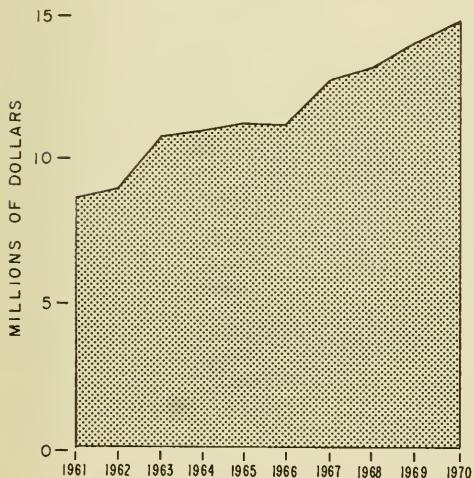


HETCH HETCHY ENERGY GENERATION AND PURCHASE

until such time as New Don Pedro Project was completed. This entitlement has now terminated. Henceforth, sale of this portion of Hetch Hetchy energy will be at higher rates, returning greater revenue to City.

Cost of Service Study

R. W. Beck & Associates, consulting engineers, are completing a "cost of service" study for the Department, the results of which will be used as a basis for renegotiation of electric service contracts with Modesto and Turlock Irrigation Districts for terms beyond the termination dates of their current contracts. The study takes into account the Department's investment in the New Don Pedro Project in determining the cost of service. This is an appropriate inclusion, since generating capability is improved by our storage space in Don Pedro Lake, and part of the debt service thus incurred should be recovered from power revenues.



REVENUE FROM SALE OF ELECTRIC ENERGY

Increased Rates to Electric Customers

By Decision No. 78186, dated January 19, 1971, the California Public Utilities Commission authorized the Pacific Gas and Electric Company to increase its electric rate amount to more than \$51,000,000 in additional annual revenue. This decision directly affected City's charges to the two Kaiser customers whose electric service contracts had been assigned to City by the Company. The new rates which became effective February 13, 1971, will result in an increase to these industrial customers of approximately 4.5 percent in charges as compared to the old rates. Rates to the assigned chemical customers were not affected.

WATER PRODUCTION AND TRANSMISSION

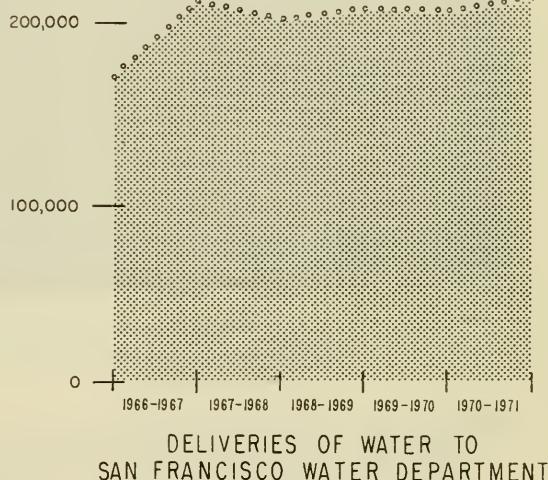
Precipitation recorded for the year at our measuring stations was 88 percent of average; however, the resultant runoff was 92 percent of normal, indicating greater-than-normal precipitation at the high elevations. Careful scheduling and monitoring of releases by the City from its reservoirs

was effected to assist the Irrigation Districts to meet their water needs in this first crucial year of Don Pedro Reservoir filling.

During the year, 68,488,800,000 gallons of water were diverted from the Tuolumne River watershed through the Hetch Hetchy Aqueduct to the San Francisco Water Department, representing 77 percent of the City's total customer consumption. In addition, 267,911,000 gallons were delivered to the United States Atomic Energy Commission at Mocho Shaft of the City's Coast Range Tunnel for use at the Lawrence Radiation Laboratory at Livermore; 50,191,500 gallons were delivered to Groveland Community Service District in Tuolumne County.

Appendix Table 6 shows comparative data on precipitation, runoff, storage and delivery of the Hetch Hetchy Water Supply System.

Acre Feet	Delivered	To SFWD	300,000
—	—	—	—



NEW DON PEDRO PROJECT

On May 22, 1971, the new Don Pedro Dam was dedicated by Mayor Joseph L. Alioto. This significant milestone was the culmination of ten years of effort on the part of officers and staff of the three constructing agencies; the City and County of San Francisco and the Turlock and Modesto Irrigation Districts. This \$100 million project (\$45 million City contribution) is a multi-purpose dam and reservoir which will provide the storage space to meet the growing demand for water of the San Francisco Water Department, at least into the first decade of the 21st century; provide water to fill the irrigation needs of farmers in the two districts; firm up power generation for the three agencies; furnish effective flood control on the Tuolumne River; and provide enormous recreational benefits for the people of California. The Federal and State governments furnished over \$14 million as an aid in construction to the Project for flood control, recreation, and fish and wildlife enhancement.



Don Pedro Lake
Moccasin Camp Ground
Entrance Kiosk

The new Don Pedro Project has generated some impressive statistics. The dam (585 feet high) is the second highest dam in the State; only Oroville Dam is higher. The reservoir (2,030,000 acre feet capacity) is the fifth largest in the State. When the reservoir is full, it will extend 26 miles upstream from the dam and will have a shoreline length of approximately 165 miles. Over \$5.5 million are being spent for recreational facilities in three locations. There is a recreation area at each end of the dam and upstream at Moccasin Point. Concessionaires will provide additional facilities such as marinas and buildings for dispensing food, beverages and other supplies.



Tuolumne River Watershed



Trolley Wires for Pure Air

TRANSIT POWER DIVISION

Two years ago the Public Utilities Commission established as policy its intent to make maximum use of non-polluting electrical energy in providing public transportation for San Francisco. This newest division of Hetch Hetchy Water and Power is responsible for supplying 600 volts direct current power to keep the streetcars and trolley coaches of the San Francisco Municipal Railway running.

The Transit Power Division is composed of two sections -- the Motive Power section and the Overhead Lines section. The Motive Power section operates and maintains seven substations which convert the electric power from 12,000 volts alternating current to 600 volts direct current.

(See Appendix Table 3) The Overhead Lines section maintains the trolley wire overhead facilities and the electrical distribution system which conveys the power from the substations to the many feed points along the trolley wires. The electrical distribution system includes both overhead and underground feeder cables.

Motive Power Section

On Saturday, March 6, 1971, at 9:36 p.m., the unattended mercury arc rectifier at West Portal Substation was automatically shut down by its protective controls. Tests showed seven of the nine excitation control transformers to be defective. Two spare transformers were installed, and five of the defective transformers were delivered to Westinghouse Electric Corporation (the manufacturer) for rewinding, since Westinghouse had no spare units in stock. The rewound transformers were returned and installed on April 20, 1971. The failure or serious deterioration of these seven transformers was due to the heat of twenty years of operation in a confined space. The two transformers that tested "satisfactory" were recent replacements and had been in service for only a few years. During the 45-day period that West Portal Substation was out of service for repairs, its load was carried by Geneva Substation, with help from PG&E Substations N and K. The annual overhaul of the substation equipment was performed during the down time, to avoid a scheduled shutdown for such work later in the year.

On April 22, 1971, at 6:55 a.m., 1500 kw Motor-Generator No. 5 in Turk Substation developed an electrical fault to ground. Inspection showed that two, and possibly three, of the stator coils had a breakdown of insulation near the terminal leads of the motor and the short circuit current went to ground through the generator armature, causing further damage of an indeterminate amount. Specialists from General Electric Company (the manufacturer) examined the machines and estimated the cost of repairing between \$9,000 and \$10,000 which would require five or six weeks on a straight time basis. Since there is adequate capacity in the remaining three machines, and it is planned to replace the substation in the near future, it was decided not to repair the unit.

Overhead Lines Section

The primary function of the Overhead Lines section is to maintain in satisfactory operating condition the trolley wire overhead facilities and the electric distribution system which conveys power to it. During fiscal year 1970-71, the Overhead Lines section responded to 3,105 emergency calls. In addition to emergency repairs, this section has a regular and extensive maintenance program for overhauling all overhead facilities.

Overhead facilities are systematically inspected, and worn or damaged parts are replaced before they can cause accidents or malfunctioning of equipment. Also, damaged trolley support poles were straightened and reinforced to avoid costly replacement. Trolley support poles, which are needed to support street lights, were extended and/or relocated for more efficient street light coverage.

The Overhead Lines section repaired 18 cases of damage to the trolley overhead facilities and/or the electric distribution system, and the parties responsible for the damage were billed a total of \$30,242.89. The City was reimbursed for 13 of the cases, totaling \$17,819 14, by the end of the fiscal year.

The Overhead Lines section also performed work for building owners and contractors under work orders amounting to \$28,734.98. This work included moving trolley poles to accommodate driveways; relocating trolley poles and feeders to permit construction of new buildings; temporarily removing trolley wires and feeders to permit passage of high loads; and shifting of trolley wires and feeders for various excavations.

The Overhead Lines section engaged in many other activities of related nature which it is especially equipped to perform. These additional duties included repairs, maintenance and construction of electrical systems in Muni's car barns, offices and shops; welding and rebuilding of worn overhead lines special work; making and rebuilding parts for switches, warning block signals, car recorders, and strand alarms for the cable car systems; installing mobile radio equipment; installing streetcar and bus stop signs and public information signs.

The Overhead Lines section overhauls the overhead wires in the Twin Peaks and Sunset Tunnels and the rights-of-way annually. Last year, extensive work was done in Twin Peaks Tunnel - 12,000 feet of 4/0 grooved trolley wire was installed to replace worn wires; 2,460 feet of 750 MCM feeder cables were installed to replace damaged cable; and new risers and disconnect switches were installed at five locations in the tunnel. All this work was done during the early morning hours to avoid interruption to streetcar service. While the work was being done, streetcars were single-tracked through the tunnel. The new feeder cable has cross-linked polyethylene insulation with a polyvinyl chloride jacket. This type of cable has many advantages over the paper-insulated lead-jacketed cable formerly used. In addition to being less expensive, it has a higher current rating because its insulation will withstand a higher temperature; it is easier to handle and install because it is much lighter and far more flexible; and it does not require the services of a highly skilled cable splicer -- an ordinary workman can make satisfactory splices.



Left to Right: Seiko Yakahi, Senior Electrical Engineer; Stanley F. Davis, Senior Architect; Wesley F. Getts, Principal Civil Engineer; Robert S. Chin, Senior Draftsman; Rino Bei, Senior Civil Engineer

ENGINEERING

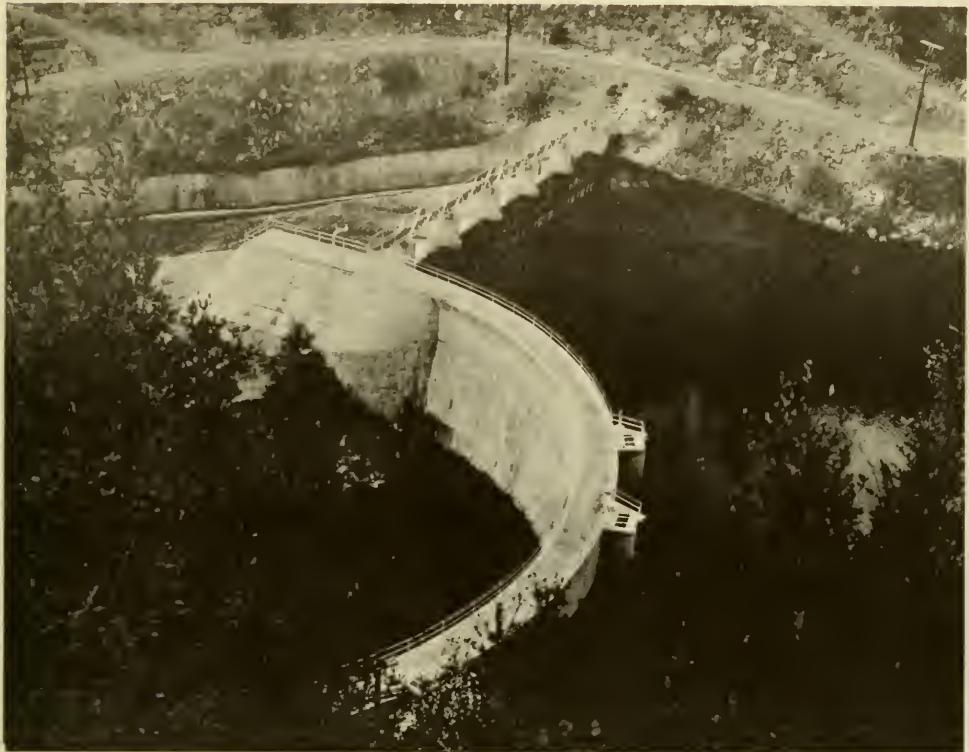
The Engineering Division of Hetch Hetchy Water and Power provides engineering services for the Hetch Hetchy Project and the Transit Power Division. These services include the preparation of studies, reports, cost estimates, and plans and specifications for new construction, for replacement of structures and for items of major maintenance. Surveying, inspection of construction, contract administration and payment recommendations are provided for all construction work under Hetch Hetchy Water and Power. Scheduling of new facilities, construction and major maintenance is done by the Engineering Division.

Specifications for procurement of major or unusual items of equipment are also prepared by the Division. Work of unusual magnitude or which requires special knowledge and expertise is done by engineering consulting firms which have the necessary manpower and qualifications. Recommendations as to the firms which are so qualified are made by the Engineering Division. Upon approval of a firm by the Public Utilities Commission, the Division prepares the necessary agreements and contracts and reviews and approves the work of the consultants.

The Engineering Division is organized into four main sections:

Structural and Civil, Electrical and Mechanical, Architectural, and Construction

During the year plans and specifications were prepared for the following work:



Intake Dam

HH414 - Repairs to Early Intake Dam

This dam has had minor leakage along the construction joints since it was constructed in 1925. At the request of the State Division of Safety of Dams, these leaks were corrected by pressure grouting with cement mortar. As an additional precaution, the upstream face of the dam was coated with neoprene and the downstream face with silicone.

HH-423 - Moccasin Reservoir Bypass

To protect the quality of the water and to minimize shutdowns of the Hetch Hetchy Aqueduct, a bypass was constructed at Moccasin Reservoir. In times of flood, when the Upper Moccasin Dam is overtopped, it will be possible to supply water directly to the Foothill Tunnel from Moccasin Powerhouse, thus avoiding contamination of the water which would require the aqueduct to be shut down.

HH-426 - Repair of Moccasin Diversion Conduit Liner Plate

The normal flow (including minor storm flow) of Moccasin Creek is carried through Moccasin Reservoir in 10 ft. diameter concrete conduit. The invert of this conduit is protected from erosion and mechanical damage caused by gravel and rocks carried through it by storm flows by means of steel liner plates. These plates had worn and some had been torn loose over the years. They were replaced by new erosion resistant steel plates laid in an epoxy mortar.

HH-428 - Restoration of Trolley Overhead on Mission and 16th Streets

The overhead wires for the Mission Street trolley coach lines were removed in 1967 to permit the construction of the BART subway along Mission Street. This work was sufficiently completed this year to allow the overhead wires to be replaced and trolley coach service restored to this part of Mission Street.

HH-429 - Construct Three Residences, Early Intake

On May 17, no bids were received for the construction of three houses at Early Intake. Consequently, it was decided to purchase pre-fabricated units for these houses and erect them under the supervision of the Engineering Division. The houses have been ordered and are scheduled for delivery and erection this fall.



Moccasin Reservoir and Powerhouse

HH-430 - Extension of Utilities to Three Residences at Early Intake

This is a companion contract to HH-429 to supply water, power, telephone and sewer service to the houses.

HH-432-R - Repairs to Jones Point-Mather, and Jones Point-Cherry Valley Roads

These roads, about 23 miles long, were patched and a seal coat of asphalt applied to prolong the life of the existing pavement.

HH-433 - Moccasin-Newark Transmission Line, Paint Steel Towers 266N to 458N

This is part of a continuing program to paint about 25 towers per year until all of the towers in need of paint have been painted.

HH-434 - Moccasin Shops and Storage Buildings

Seven of the original buildings in the Moccasin shop area, dating back to the 1920's will be rehabilitated by installing new metal roofing and siding in place of the old corrugated metal. Since these buildings are structurally sound, this work will add years to their life.

HH-435 - Repairs to Dion Holm Powerhouse

Plans were prepared to repair and caulk the walls and the roof flashing at this powerhouse.

HH-436 - Replace Domestic Water System, West Portal and Priest Reservoir

The present water piping is over 35 years old and in poor condition. The pump will also be replaced with a more modern design.

HH-437 - Resurface Roads at Moccasin

Streets and parking areas were patched and resurfaced.

HH-438 - Moccasin Administration Building and Dormitory

New shower facilities will be installed in the Moccasin Dormitory. Both buildings will have their electrical systems upgraded to modern standards and certain areas will receive acoustical treatment and new floor coverings. Interior painting will be done.

HH-440 - Paint Steel Trolley Poles

A survey was made of Municipal Railway trolley poles to determine those most in need of painting. Plans and specifications were prepared for the work.

HH-442 - Motorize Valves, San Joaquin Pipelines

This will provide for operation of six large butterfly valves controlling the flow in the San Joaquin Pipelines by electric motors instead of by hand. It requires two men and several hours time to open or close these valves by hand. With the motor operators one man will be able to do the job in an hour or less.

HH-444 - Bryant Substation Office

Additional office space will be provided at Bryant Substation so that all functions of the Transit Power Division can be headquartered at one location.

HH-446 - Temporary Timber Flume, Moccasin Powerhouse Tailrace

In anticipation of the construction of the Moccasin Reservoir Bypass, a temporary timber flume was designed to pass the water from the powerhouse around the construction area.

HH-449 - Cottage No. 1 O'Shaughnessy Dam, Renovate and Repair

This will include replacement of windows and lighting fixtures and painting.

Repairs to Moccasin Penstock Supports

A number of the concrete saddles supporting the penstocks at Moccasin had settled due to erosion of the hillside over a 45-year period. To avoid shutting down the powerhouse to do this remedial work, a program was worked out with a contractor specializing in foundation grouting to jack the supports back in position and to grout the ground under the support to restore its load carrying capability. This program was successfully carried out and resulted in a considerable saving of money over other methods of reconstruction.

Transmission Lines at Red Mountain Bar

The construction of New Don Pedro Dam will raise the water surface of the reservoir to elevation 830 which is 225 feet higher than the old dam. This will create a body of water 2500 feet wide for our transmission lines to cross instead of the 1000-foot wide reservoir that we now have to contend with. This contract, at the expense of the New Don Pedro Project, relocated two towers to either side of the newly created reservoir with new conductors between. The old towers below the new water level were removed.

Bechtel Corporation was retained to make a study of the power supply and distribution facilities of the Municipal Railway and to prepare recommendations as to the improvements and revisions which will be needed to provide power for the new subway system and cars and to bring the entire power system to modern standards.

The Engineering Division worked closely with Bechtel Corporation to determine operating and design criteria for the new system and to provide basic data on the present system.

Monthly generating schedules were prepared for the optimum operation of Holm, Kirkwood and Moccasin hydroelectric plants. Metering and billing were done for industrial electric power customers of Hetch Hetchy, including the Modesto and Turlock Irrigation Districts.

Numerous meetings and conferences were attended with the Transit Task Force and BARTD to discuss and resolve the many problems of the Municipal Railway power facilities coordination with BARTD and with the Market Street beautification program.

The Construction Section provided field surveys, construction inspection and contract administration for some twenty contracts and projects as tabulated hereinafter.

STREET LIGHTING

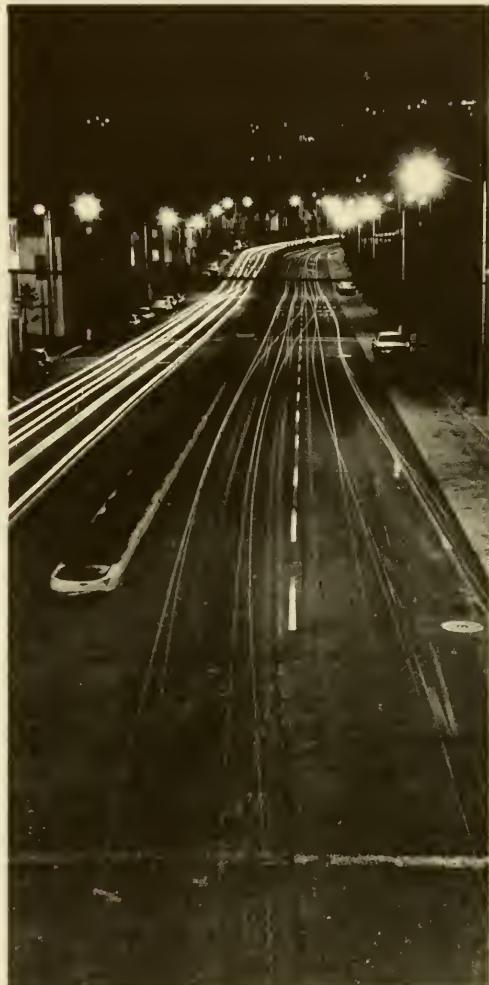
(Bureau of Light, Heat and Power)

The lighting of public streets within the City of San Francisco is provided by facilities which are, on a City-wide basis, 36.9% owned by the City; 59.8% owned by Pacific Gas and Electric Co.; and a small percentage, 3.3% jointly owned. In the underground areas, where the economic advantage of City ownership is greatest, 74.4% of the lights are City-owned. In the past ten years this figure increased from 57.5 percent.

In fiscal 1933-34, the cost for street lighting was \$1.25 per capita; today, with twenty-five times as much light on the streets and public thoroughfares, the cost per capita is approximately \$2.17.

During the fiscal year 1970-71, maintenance and repair of City-owned installations was performed under two contracts. One provided for group replacement of lamps in accordance with schedules developed by the Department. A second contract covered work required for repair of defective and damaged equipment, painting, and miscellaneous maintenance.

Under contract, Pacific Gas and Electric Company furnished street lighting service as directed, including the furnishing, maintenance and operation of Company-owned facilities. Certain services were provided also for City-owned facilities, including switching and control, replacement



Street Lighting on
Bosworth Street

of individual lamps and globes, and emergency work required during other than normal working hours.

Electric energy for all City and Company-owned street light operation was supplied by the Hetch Hetchy power system.

Operation and Maintenance

As of June 30, 1971, a total of 35,852 City-owned and Company-owned street lights were in service in public streets, parks, viaducts, overcrossings, tunnels and underpasses. A summary of the number and types of units in service at the end of the fiscal year is shown in Appendix Table 11.

A total of \$1,247,176 was expended for operation, maintenance, and repair of the street lighting system. Of the total cost, \$11,925 was paid by the State for its share of operating and maintenance of street lighting at intersections on City streets which are part of the State highway system.

Improvements

During the fiscal year 1970-71, an all time record for street light improvements was established. A total of 1,845 new City-owned electroliers were placed in service at a cost of \$2,040,453. Improvements were financed through the 1964 Street Lighting Bond Issue, and through the Road Fund, as indicated in Appendix Tables 13 and 14.

Contracts now nearing completion will, in the immediate future, add another 1,170 units.

Engineering and contract supervision is performed by the Department of Public Works, subject to approval by the Public Utilities Commission, through the Bureau of Light, Heat and Power.

Damages

During the fiscal year 117 street lights were damaged by vehicles at a cost of \$52,993. Previous experience indicates that 71% of the repair costs will be recovered from the responsible parties.

UTILITY SERVICES TO MUNICIPAL DEPARTMENTS

General

Electric energy supplied to municipal departments is generated on the Hetch Hetchy power system and delivered from Newark to various service points by transmission and distribution facilities of Pacific Gas and Electric Company under a wheeling contract. Natural gas and steam supplied to municipal departments is furnished by Pacific Gas and Electric Company under a service contract.

Municipal Consumption of Electricity, Gas and Steam

During the fiscal year, 309,056,306 kilowatthours of electrical energy were consumed through 916 municipal accounts at an expenditure of \$3,322,882. A saving of \$883,298 was realized as a result of purchasing Hetch Hetchy energy, as compared to commercial rates. Additionally, 145,863,339 kilowatthours of energy were supplied to the San Francisco International Airport for resale to tenants for \$1,244,926.

During the past ten years electrical consumption for municipal purposes has increased by 78.8 percent.

Natural gas consumption was 18,019,276 therms through 550 accounts at a cost of \$1,038,506. One account consumed 2,334,000 pounds of steam at a cost of \$4,532.

A summary of consumption and expenditures for these commodities is shown in Appendix Tables 12 and 13.

A P P E N D I X

TABLE 1

BETCH HETCHY WATER AND POWER

COMPARISON OF BUDGETED AND ACTUAL EXPENDITURES (INCLUDING ENCUMBRANCES)

FISCAL YEAR 1970-71

OE	DESCRIPTION	BUDGET	ACTUAL	-UNDER, OVER
110	Permanent Salaries	\$ 621,697	\$ 574,298	\$ -47,399
111	Allowance for Overtime	13,225	10,175	-3,050
112	Allowance for Holidays	5,880	4,642	-1,238
113	Extended Work Week	6,724	3,466	-3,258
120	Temporary Salaries	41,358	35,136	-6,222
130	Wages	993,102	1,001,612	8,510
139	Wages - Gardeners	38,289	33,296	-4,993
200	Contractual Service	53,760	65,093	11,333
216	Maint. and Repair of Auto Equipment	14,000	12,913	-1,087
231-1	Purchase of Power for Resale	700,000	615,353	-84,647
231-2	Service Charge for Transm. and Dist.	2,264,100	2,379,540	115,440
251	Subsistence of Employees	9,500	10,390	890
300	Materials and Supplies	107,600	144,563	36,963
640	Water Rights and Damage Claims	24,000	11,050	12,950
641	Hydrography	12,000	7,245	4,755
801	Accident Compensation	12,000	7,384	4,616
812	Fidelity Insurance	53	72	19
813	Automobile Insurance	5,400	5,028	-372
814	Fire Insurance	10,500	10,382	-118
815	Miscellaneous Insurance	10,500	10,556	56
854	Membership Dues	2,771	3,434	663
855	Fee to U. S. Gov't. - Raker Act	30,000	30,000	-0-
856	Maint. Roads and Trails - Raker Act	25,000	6,489	-18,511
860	Retirement Allowance	284,138	216,590	-67,548
862	Social Security	77,315	55,433	-21,882
865	Health Service System	20,240	20,876	-5,364
870	Taxes	322,828	382,117	59,289
880	Rentals - Transmission Lines, Offices	122,000	40,500	-81,500
900	Services of Other Departments	586,127	368,552	-217,875
TOTAL OPERATION AND MAINTENANCE		\$ 6,420,107	\$ 6,065,885	\$ -354,222
400	Equipment	56,920	94,074	37,154
500	Additions and Betterments	524,129	524,129	-0-
700	Reconstruction and Replacement	667,711	667,711	-0-
800	Bond Interest and Redemption	9,253,858	8,903,896	349,962
TOTAL		\$16,922,725	\$16,255,695	\$ -667,030

* Includes expenditures, encumbrances, and unencumbered balance allocated for subsequent construction.

TABLE 2
HETCH HETCHY WATER AND POWER
TAXES
FISCAL YEAR 1970-71

<u>Tax Levy ing Bodies</u>	<u>Assessed Value</u>	<u>Total Amount of Taxes</u>
Alameda County	\$ 1,725	\$ 184.94
San Joaquin County	27,600	2,888.86
San Mateo County	2,800	306.50
Stanislaus County	89,290	10,354.32
Tuolumne County	4,383,999 (a)	367,155.52
Banta-Carbona Irrigation District	3,192	151.62
Oakdale Irrigation District	12,320	985.60
West Stanislaus Irrigation District	1,800	90.00
	\$4,522,726	\$382,117.36

(a) Includes \$3,560,000 assessment for water rights.

TABLE 5

TRANSIT POWER DIVISION

NOTIVE POWER SECTION - SUBSTATIONS

Substation	Type (a)	date Installed	No. of units	Fiscal Year 1970-71	
				Max. Load in kW	kWh Converted to 600 V d-c
Bryant	M-G	1910	3	1500	6,650,200
	M-G	1910	(b) 2	1500	
Turk	N-G	1910	3	1500	9,164,700
	M-G	1910	(b) 2	1500	
Downtown	SC	1921	2	2000	9,808,000
	SC	1924	1	3000	
Eighth Avenue	SC	(C) 1921	1	1500	3,101,800
	SC	(C) 1921	(b) 1	1500	
	SC	1924	1	2000	
West Portal	NAR	1951	1	2000	2744
Outer Mission	NAR	1953	1	750	755
Geneva	M-G	1910	3	1500	1680
					<u>512,700</u>
					37,717,400

Notes: (a) Type of Conversion Equipment:

M-G = Motor-Generator

SC = Synchronous Converter

NAR = Mercury Arc Rectifier

(b) Indicates units that are not serviceable. Units have not been repaired because of the high cost and because they are not needed to carry the present load. Also, it is planned to replace the conversion equipment with modern silicon rectifiers in the near future.

(c) Units were originally installed at Washington and Mason in 1914 and were moved to Eighth Avenue in 1921.

TABLE 4

HETCH HETCHY WATER AND POWER

TRANSIT POWER DIVISION

COMPARISON OF BUDGETED AND ACTUAL EXPENDITURES

FISCAL YEAR 1970-71

<u>OE</u>	<u>DESCRIPTION</u>	<u>BUDGET</u>	<u>ACTUAL</u>	<u>-UNDER, OVER</u>
110-1	Permanent Salaries	\$ 74,363	\$ 64,884	\$ 9,479
120-1	Temporary Salaries	-0-	2,804	2,804
130-1	Wages - Permanent	567,132	709,351	142,219
130-2	Wages - Temporary	10,000	18,000	8,000
130-3	Wages - Overtime	86,192	163,964	77,772
860-1	Retirement Allowance	87,797	90,992	3,195
862-1	Social Security	20,685	23,400	2,715
865-1	Health Service System	4,060	7,050	2,990
<hr/>				
TOTAL OPERATION AND MAINTENANCE -		\$ 850,229	1,080,445	\$ 230,216
<hr/>				
400	Equipment	37,080	37,080	-0-
500-1	Additions and Betterments	9,800	9,800	-0-
700-1	Reconstruction and Replacement	1,045,000	1,045,000	-0-
<hr/>				
TOTAL		\$ 1,942,100	\$ 2,172,325	\$ 230,216
<hr/>				

* Includes expenditures, encumbrances, and unencumbered balance allocated for subsequent construction.

TABLE 5
HETCH HETCHY WATER AND POWER
SUMMARY OF RECEIPTS AND EXPENDITURES
FISCAL YEAR 1970-71

<u>RECEIPTS</u>	<u>BUDGET</u>	<u>ACTUAL</u>	<u>-UNDER OVER</u>
Revenue from Sale of Electric Energy	\$ 15,583,500	\$ 14,981,938	\$ 1,398,438
Revenue from Sale of Water and Standby Charge, SFWD	4,500,000	4,500,000	-0-
Other Revenue	65,000	134,544	69,544
 <u>TOTAL GROSS REVENUE</u>	 \$ 18,148,500	 \$ 19,616,482	 \$ 1,467,982
 <u>EXPENDITURES</u>			
Total Expenditures (From Tables 1-A & B)	\$ 18,864,834	\$ 18,428,020	\$ -436,814
 <u>EXCESS OF RECEIVE OVER EXPENDITURES</u>	 \$ -716,334	 \$ 1,188,462	 \$ 1,904,796

TABLE 6
HETCH HETCHY WATER SUPPLY

PRECIPITATION, RUNOFF, STORAGE AND DELIVERY
AS OF JUNE 30 BY FISCAL YEARS

	<u>Normal</u>	<u>1966-67</u>	<u>1967-68</u>	<u>1968-69</u>	<u>1969-70</u>	<u>1970-71</u>
<u>SEASON PRECIPITATION (INCHES)</u>						
Hetch Hetchy	34.24	49.02	21.68	56.24	35.07	29.95
Lake Lloyd	47.46	66.69	30.80	76.45	51.94	41.94
Approx. Percent of Normal	142%	64%	64%	162%	106%	88%
<u>WATERSHED RUNOFF (ACRE-FT.) (a)</u>						
Hetch Hetchy	731,731	839,900	758,700	1,157,000	890,200	817,000
Lake Lloyd	427,666	569,800	385,600	704,300	518,400	439,700
Total	1,159,397	1,409,700	1,144,300	1,861,300	1,408,600	1,256,700
Approx. Percent of Normal	122%	99%	99%	161%	121%	108%
<u>RESERVOIR STORAGE (ACRE-FT.) (a)</u>						
Hetch Hetchy	No-Spill Capacity 360,360	316,010	293,680	349,575	357,208	356,617
Lake Lloyd	268,800	249,001	197,916	260,021	245,854	199,983
Lake Eleanor	27,100	26,339	26,339	24,286	27,016	27,403
Total	656,260	591,350	517,935	633,882	628,078	584,003
<u>DELIVERY TO SFWD (ACRE-FT.) (a) (b)</u>						
Average per day	572	506	563	566	578	
Maximum per day	698	861	853	856	748	
Total for fiscal year	208,821	185,342	205,426	206,514	210,997	

Total since operation of Hetch Hetchy Aqueduct began in 1934

3,672,824

NOTES: (a) One acre-foot equals 325,900 gallons or approximately 1/3 million gallons.

(b) Includes delivery to Livermore site, U. S. Atomic Energy Commission.

TABLE 7
HETCH HETCHY POWER SYSTEM

ELECTRIC ENERGY GENERATED, PURCHASED, AND DISTRIBUTED
FISCAL YEAR 1970-71

<u>PLANT DATA</u>	<u>Nameplate Rating (Kilowatts)</u>	<u>Capability (Kilowatts)</u>	<u>Annual Plant Factor - %</u>
Moccasin Powerhouse	90,000	104,000	58.4
Dion R. Holm Powerhouse	135,000	150,000	68.0
Robert C. Kirkwood Powerhouse	67,500	85,000	84.8
Total	292,500	339,000	
<u>ENERGY GENERATED AND PURCHASED (KILOWATT-HOURS)</u>			
<u>Gross Generation</u>			
Moccasin Powerhouse	532,100,000		
Dion R. Holm Powerhouse	893,352,000		
Robert C. Kirkwood Powerhouse	651,625,000		2,057,077,000
<u>Station Service</u>			
Moccasin Powerhouse	1,029,000		
Dion R. Holm Powerhouse	1,121,600		
Robert C. Kirkwood Powerhouse	750,900		2,901,700
<u>Net Generation</u>			2,054,175,500
<u>Supplementary Energy</u>			
"Bank" Withdrawal*		133,964,745	
Purchase (PG&E Co.)		46,097,953	
<u>Total</u>			2,234,237,998
<u>ENERGY DISTRIBUTED (KILOWATT-HOURS)</u>			
<u>Sales</u>			
Municipal Accounts	458,127,155		
Modesto Irrigation District	728,371,000		
Turlock Irrigation District	321,456,000		
Kaiser Cement and Gypsum Corporation	152,736,000		
Kaiser Aluminum and Chemical Corporation	39,549,600		
Norris Industries, Inc.	24,033,485		
Hercules, Inc.	94,662,000		
California Ammonia Company	104,280,480		
Air Products and Chemicals Co.	32,653,056		
Valley Nitrogen Producers, Inc.	108,631,560		
Miscellaneous Customers	754,614		
<u>Non-Revenue</u>			
Project Use	4,101,136		
"Bank" Deposit*	47,826,652		
<u>Losses</u>			
Hetch Hetchy System	40,625,724		
PG&E System (Municipal and Industrial Accounts)	76,438,536		
<u>Total</u>		2,234,237,998	

*In accordance with letter-agreement between City and PG&E Co. dated August 1, 1960.

TABLE 8
METCITY POWER SYSTEM

COMPARATIVE ELECTRIC ENERGY SALES TO CUSTOMERS
FISCAL YEARS 1969-70 and 1970-71
(Nearest 100,000 kilowatt hours)

CUSTOMER	<u>1969-70</u>	<u>1970-71</u>
Municipal Accounts		
International Airport	161,700,000	184,500,000
Municipal Railway	66,500,000	64,100,000
Public Works	22,500,000	24,600,000
Street Lighting	43,100,000	43,400,000
Unified School District	30,800,000	34,400,000
Water Department	40,200,000	42,300,000
Other City Departments	62,400,000	64,800,000
Modesto Irrigation District	638,000,000	728,400,000
Turlock Irrigation District	271,200,000	321,500,000
Kaiser Cement and Gypsum Corp.	168,700,000	152,700,000
Kaiser Aluminum and Chemical Corp.	39,200,000	39,500,000
Norris Industries, Inc.	35,700,000	24,000,000
Hercules, Inc.	92,800,000	94,700,000
California Ammonia Company	103,000,000	104,300,000
Air Products and Chemical Co.	34,600,000	52,700,000
Valley Nitrogen Producers, Inc.	124,900,000	108,600,000
Miscellaneous Customers	700,000	700,000
TOTAL	1,936,000,000	2,065,200,000

TABLE 9
HETCH HETCHY POWER SYSTEM

COMPARATIVE GROSS REVENUE RECEIVED FROM SALE OF ELECTRIC ENERGY
FISCAL YEARS 1969-70 AND 1970-71
(Nearest \$1,000)

<u>CUSTOMER</u>	<u>1969-70</u>	<u>1970-71</u>
Municipal Accounts		
International Airport	\$ 1,322,000	\$ 1,502,000
Municipal Railway	668,000	649,000
Public Works	278,000	299,000
Street Lighting	456,000	459,000
Unified School District	475,000	518,000
Water Department	363,000	372,000
Other City Departments	770,000	808,000
Modesto Irrigation District	3,785,000	4,295,000
Turlock Irrigation District	1,461,000	1,745,000
Kaiser Cement and Gypsum Corp.	1,323,000	1,270,000
Kaiser Aluminum and Chemical Corp.	329,000	342,000
Norris Industries, Inc.	394,000	275,000
Hercules, Inc.	642,000	678,000
California Ammonia Company	705,000	744,000
Air Products and Chemicals Co.	240,000	235,000
Valley Nitrogen Producers, Inc.	871,000	784,000
Miscellaneous Customers	8,000	8,000
 TOTAL	 \$ 14,090,000	 \$ 14,983,000

TABLE 10
HETCH HETCHY POWER SYSTEM
ELECTRIC ENERGY GENERATED, PURCHASED, AND DISTRIBUTED BY FISCAL YEARS --- KILOWATT-HOURS

NET GENERATION		1965-66	1966-67	1967-68	1968-69	1969-70	1970-71
Koccasin Powerhouse		522,006,700	515,158,600	528,512,500	465,854,212	493,702,900	531,070,800
Bion R. Holm Powerhouse		918,704,430	789,570,220	733,220,320	944,664,850	887,037,320	892,230,400
Early Intake Powerhouse		0	3,000	---	---	---	---
Robert C. Kirkwood Powerhouse		0	210,829,330	613,159,620	598,681,120	615,542,120	630,874,100
Subtotal		1,440,711,130	1,515,561,150	1,874,892,440	2,009,200,182	1,996,282,340	2,054,175,300
SUPPLEMENTAL ENERGY							
"Bank" Withdrawal*	Purchase (PG&E Co.)	18,140,548	255,197,673	116,276,026	81,906,642	191,365,500	133,964,745
		<u>233,397,451</u>	<u>0</u>	<u>40,798,879</u>	<u>0</u>	<u>0</u>	<u>46,097,953</u>
Subtotal		251,537,999	255,197,673	116,276,026	122,705,521	191,365,500	180,062,698
TOTAL		1,692,249,129	1,770,758,823	1,991,168,466	2,131,905,703	2,187,647,840	2,234,237,998
DISTRIBUTION							
Sales							
Municipal Accounts		358,564,327	361,956,735	388,836,371	412,201,831	427,168,499	458,127,155
Modesto Irrigation Dist.		454,291,800	512,112,000	557,184,000	597,864,000	637,972,000	728,371,000
Turlock Irrigation Dist.		173,064,904	206,568,000	248,457,600	263,616,000	271,156,800	321,456,000
Kaiser Cement & Gypsum		163,529,750	149,419,000	175,655,640	173,061,180	168,705,080	152,736,000
Kaiser Aluminum & Chemical		16,968,000	24,600,324	24,534,411	30,744,000	39,240,000	39,549,000
Norris Industries, Inc.		---	27,262,386	60,637,939	35,914,140	35,721,216	24,033,485
Now Chemical Company		309,582,408	95,705,880	75,829,720	23,582,132	---	---
Hercules, Inc.		138,762,000	112,572,000	112,358,000	7,776,000	92,844,000	94,662,000
Shell Chemical Co.		---	50,346,000	50,570,000	---	---	---
California Ammonia Co.		---	18,992,040	100,845,672	101,720,736	103,020,000	104,280,480
Air Products & Chemicals		---	---	20,762,304	32,930,496	34,617,984	32,653,056
Valley Nitrogen Producers		---	---	---	28,675,920	124,884,480	108,631,560
Miscellaneous Customers		1,294,252	1,045,156	1,046,804	1,016,562	664,093	745,614
Non-revenue							
Project Use		3,306,403	3,716,688	3,468,127	3,787,748	3,744,004	4,101,136
"Bank" Deposit*		0	110,919,058	60,324,204	205,895,527	135,151,010	47,826,652
Losses		92,885,285	94,543,056	111,877,674	102,119,431	112,758,674	117,064,260
TOTAL		1,692,249,129	1,770,758,823	1,991,168,466	2,131,905,703	2,187,647,840	2,234,237,998

*In accordance with letter-agreement between City and PG&E Co. dated August 1, 1960.

TABLE 11
BUREAU OF LIGHT, HEAT AND POWER

COMPARISON OF BUDGETED AND ACTUAL EXPENDITURES AND RECEIPTS
(INCLUDING ENCUMBRANCES)

FISCAL YEAR 1970-71

OE	DESCRIPTION	BUDGET	ACTUAL	-UNDER +OVER
		<u>EXPENDITURES</u>		
110	Permanent Salaries	\$ 144,083	\$ 137,363	- 6,720
111	Allowance for Overtime	600	483	- 117
112	Holiday Pay	300	300	0
199	Compensation Reserve		5,674	+ 5,674
200	Contractual Services	1,400	474	- 926
231	Lighting and Heating of Public Buildings - General	1,115,715	1,111,456	- 4,259
231-1	Lighting and Heating of Public Buildings - Special Fund	4,160,987	4,078,261	- 82,726
231-2	Lighting of Public Streets - Pacific Gas and Electric Co.	585,188	596,214	+11,026
231-3	Lighting of Public Streets - Hetch Hetchy	435,000	446,881	+11,881
231-4	Lighting of Public Streets - Calif. Division of Highways	1,000	625	- 375
300	Materials and Supplies	675	260	- 415
400	Equipment	0	0	0
813	Auto Insurance	500	444	- 56
860	Retirement Allowance	16,245	13,480	- 2,765
862	Social Security	4,781	2,671	- 2,110
865	Health Service System	1,860	1,284	- 576
954	ELP - PUC Data Processing	9,000	9,000	0
	TOTAL	<u>\$6,477,334</u>	<u>\$6,285,070</u>	<u>-72,464</u>
		<u>RECEIPTS</u>		
	Interfund Receipts*	\$4,270,287	\$4,184,106	-86,181
	Ad Valorem Taxes	<u>2,207,047</u>	<u>2,100,964</u>	<u>-106,083</u>
	TOTAL	<u>\$6,477,334</u>	<u>\$6,285,070</u>	<u>-192,264</u>

WORK ORDER APPROPRIATIONS FROM ROAD FUND

DESCRIPTION	TOTAL FUNDS	EXPENDITURE	-UNDER +OVER
Maintenance and Repair of Street Lighting Installations	\$136,000	\$124,282	-\$13,718

*Transfers from other departments.

TABLE 12
BUREAU OF LIGHT, HEAT AND POWER

EXPENDITURE FOR ELECTRICITY FOR MUNICIPAL PURPOSES
FISCAL YEAR 1970-71

DEPARTMENT	NO. OF ACCOUNTS	CONSUMPTION KILOWATT-HOURS	EXPENDITURES
Art Museum	1	722,996	7,967
Auditorium and Brooks Hall	1	4,728,200	51,289
Child Care Centers	9	122,463	3,021
City Planning	1	75,640	1,556
DeYoung Museum	1	2,593,600	25,483
Disaster Corps	2	770	52
Electricity	5	467,616	8,092
Farmers Market	1	11,480	290
Fire (a)	59	2,945,604	60,308
Hassler Health Home	1	719,200	7,873
Health	24	10,860,220	109,133
Hetch Hetchy	6	129,517	3,579
Hidden Valley Ranch	1	945,360	10,844
International Airport (b)	7	184,470,853	1,502,177
Junior College District	12	5,338,175	57,925
Legion of Honor	1	398,400	5,562
Library	31	2,821,523	47,306
Log Cabin Ranch	13	371,410	10,184
Municipal Railway	39	64,085,276	648,802
Parking Authority	19	190,687	4,509
Police	16	915,772	18,334
Public Buildings	9	15,291,103	132,530
Public Works	63	24,358,542	294,035
Purchasing	5	477,336	7,274
Real Estate	2	8,810	234
Recreation and Park	193	10,126,517	171,846
Recreation and Park - Yacht Harbor	35	1,323,279	28,444
Sheriff	3	1,629,120	15,970
Social Services	7	1,229,005	16,366
Street Lighting Operations (.003)	-	43,350,341	446,881
Unified School District	232	29,076,043	460,038
War Memorial	1	1,213,404	16,020
Water	115	42,344,170	371,784
Youth Guidance	3	1,577,213	16,100
TOTAL MUNICIPAL DEPARTMENTS	918	454,919,645	4,561,808
Academy of Sciences	2	2,922,106	26,607
Mount Davidson Cross Lighting		(c)	1,000
State of California: Street Lighting	1	(d)	11,941
Traffic Devices	1	285,404	5,642
TOTAL FROM HETCH HETCITY	922	458,127,155	4,606,998
Fire Dept., For Resale to Fort Mason	1	2,564,066	30,201
GRAND TOTAL	923	460,691,221	4,637,199

NOTES: (a) Electricity purchased for resale to Fort Mason excluded.
 (b) Includes 145,863,339 KWH resold at Commercial rates for \$1,244,926 to Airport tenants.
 (c) Included under Recreation and Park.
 (d) Included under Street Lighting Operations.

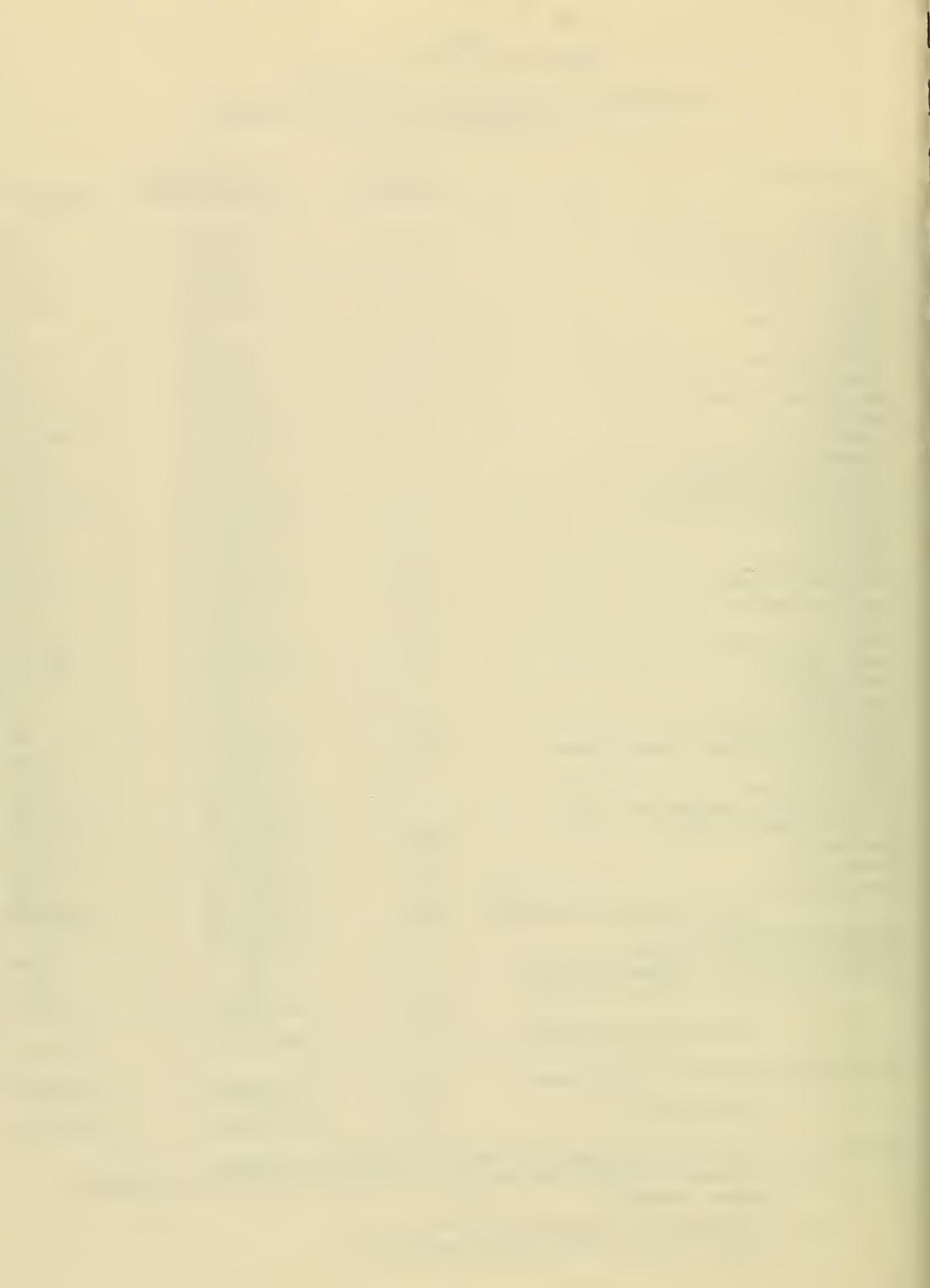


TABLE 13
BUREAU OF LIGHT, HEAT AND POWER

EXPENDITURE FOR GAS AND STEAM FOR MUNICIPAL PURPOSES
FISCAL YEAR 1970-71

NATURAL GAS

<u>DEPARTMENT</u>	<u>NO. OF ACCOUNTS</u>	<u>CONSUMPTION THERMS</u>	<u>EXPENDITURE</u>
Auditorium and Brooks Hall	2	1,026	98
Child Care Centers	8	28,185	1,991
City Planning	1	5,576	383
DeYoung Museum	1	281,326	17,996
Disaster Corps	1	387	40
Electricity	2	52,785	3,431
Farmers Market	1	710	62
Fire	59	713,216	45,954
Hassler Health Home	3	278,891	17,960
Health	24	4,113,022	197,844
Hetch Hetchy	2	1,366	140
International Airport	7	1,632,031	82,688
Junior College District	8	730,619	42,101
Library	29	111,880	7,811
Municipal Railway	13	279,205	18,052
Police	10	52,865	3,627
Public Buildings	5	1,433,362	75,967
Public Works	15	598,297	39,657
Purchasing	4	61,496	3,762
Recreation and Park	107	1,398,947	91,807
Registrar of Voters	1	6,934	470
Real Estate	1	1,751	123
Sheriff	2	361,189	19,906
Single Men's Rehabilitation Center	1	37,022	2,367
Social Services	4	71,263	4,654
Unified School District	217	4,555,407	289,434
War Memorial	3	267,221	17,149
Water	13	150,760	10,012
Youth Guidance	4	483,169	25,988
TOTAL MINICIPAL DEPARTMENTS	548	17,709,908	1,021,474
Academy of Sciences	2	309,368	17,032
GRAND TOTAL	550	18,019,276	1,038,506

STEAM

(Does not include steam generated by City)

<u>DEPARTMENT</u>	<u>NO. OF ACCOUNTS</u>	<u>CONSUMPTION POUNDS</u>	<u>EXPENDITURE</u>
Social Services	1	2,334,000	4,532

TABLE 14
BUREAU OF LIGHT, HEAT AND POWER

STREET LIGHTS IN SERVICE

JUNE 30, 1971

<u>SIZE AND TYPE OF LAMP</u>	<u>COMPANY-OWNED</u>	<u>JOINTLY-OWNED</u>	<u>CITY-OWNED</u>	<u>TOTAL</u>
<u>UNDERGROUND CONNECTED</u>				
<u>High Voltage Series Circuit</u>				
1,000-Lumen Incandescent	---	22	---	22
2,500 " "	276	24	175	475
4,000 " "	1,323	166	1,900	3,389
6,000 " "	761	371	3,693	4,825
10,000 " "	287	1	565	853
23,000 " Fluorescent	3	---	1	4
400-Watt Mercury Vapor	4	221	161	386
1,000 " "	---	---	3	3
175-Watt Mercury Vapor	---	---	6	6
<u>Low Voltage Multiple Circuit</u>				
1,000-Lumen Incandescent	---	---	111	111
2,500 " "	17	22	67	106
4,000 " "	193	2	82	277
6,000 " "	43	142	100	285
10,000 " "	93	---	18	111
5,500 " Fluorescent	---	---	38	38
23,000 " "	10	---	2	12
100-Watt Mercury Vapor	---	---	101	101
175 " "	22	---	1,906	1,928
250 " "	31	---	686	717
400 " "	293	221	3,192	3,706
700 " "	---	---	222	222
1,000 " "	---	---	149	149
400 " Lucalox	---	---	21	21
<u>OVERHEAD CONNECTED</u>				
<u>High Voltage Series Circuit</u>				
2,500-Lumen Incandescent	2	---	---	2
4,000 " "	44	---	42	86
6,000 " "	10	---	---	10
<u>Low Voltage Multiple Circuit</u>				
2,500-Lumen Incandescent	18	---	---	18
4,000 " "	78	---	11	89
6,000 " "	5	---	---	5
175-Watt Mercury Vapor	15,026	---	---	15,026
250 " "	2,012	---	---	2,012
400 " "	883	---	---	883
TOTAL, JUNE 30, 1971	21,434	1,192	13,252	35,878
	59.8%	3.3%	36.9%	100%
TOTAL, JUNE 30, 1970	22,301	1,018	12,533	35,852
NET CHANGE DURING THE YEAR	-867	+174	+719	+26

TABLE 15
BUREAU OF LIGHT, HEAT AND POWER

EXPENDITURES FOR OPERATION AND MAINTENANCE OF STREET LIGHTING
FISCAL YEAR 1970-71

CONTRACTUAL SERVICE

P. G. & E. Company

Company-owned facilities (a)	£835,190
Jointly-owned facilities (a)	67,408
City-owned facilities (b)	149,914
Emergency service to City-owned facilities	3,635
Less deduction for energy component	1,055,247
	447,995
	607,252

Lease-Lite Corporation

Group lamp replacement - City-owned facilities	37,620
--	--------

Lease-Lite Corporation

Maintenance and repair - City-owned facilities	
Routine maintenance	20,508
Repair of damage caused by accidents (c)	32,071
Repair of damage caused by equipment failure	14,023
Repair of damage caused by vandals	1,578
	68,180

MATERIAL AND SUPPLIES (FURNISHED BY CITY)

Damage caused by accidents (c)	13,136
Damage caused by equipment failure	1,940
Damage caused by vandals	662
	15,735

ELECTRIC ENERGY (HETCHI HETGY)

47,562,434 kWh @ \$0.01345 less 21% discount	505,375
--	---------

TOTAL EXPENDITURE

1,234,162

LESS AMOUNT PAID TO HETCHI HETGY FROM:

Gas Tax Funds for State Highway routes	11,925
Recreation and Park Dept. for off-street lighting	1,089
	13,014

TOTAL NET EXPENDITURE

\$1,247,176

AVERAGE OPERATING COST PER LIGHT

Based on number of lights in service June 30, 1970, average total cost of operation, maintenance and repair per light per year:

\$34.76

NOTES: (a) Includes maintenance, repair, fixed charges and electric energy for Company-owned facilities.

(b) Includes replacement of individual lamps and broken glassware, service and switching charges, and electric energy.

(c) When responsible party is known, claim is filed for recovery of cost.

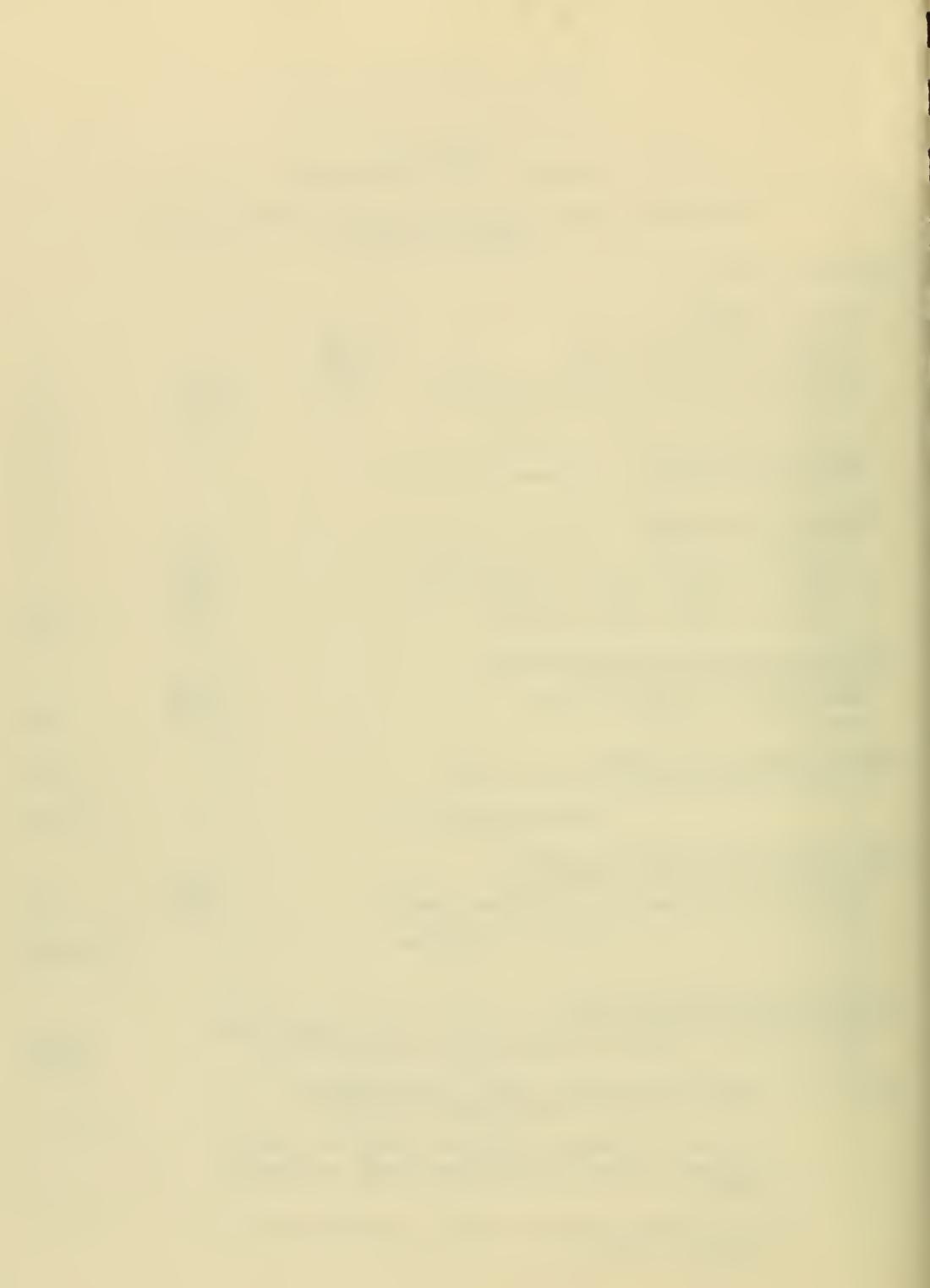


TABLE 16
BUREAU OF LIGHT, HEAT AND POWER
NEW CITY-OWNED STREET LIGHTING INSTALLATIONS
COMPLETED DURING FISCAL YEAR 1970-71

<u>Location</u>	<u>No. of Lights</u>	<u>Type of Lights (a)</u>	<u>Value</u>
Financed by 1964 Street Lighting Bonds:			
San Jose Ave. - Ocean to Randall	110	M	88,120
California St. - Kearny to Drumm	40	M	45,471
Fulton Street	128	M	138,890
South of Market - Contract 1A	234	M	261,153
Pine St. - Van Ness to Davis	85	M	72,809
Phelan Ave. - Ocean to Flood	14	M	7,535
Jordan Park	38	M	49,332
North of Market - Contract 1	173	M	166,050
South of Market - Contract 1B	157	M	181,963
South of Market - Contract 1C	133	M	166,786
South of Market - Contract 2	127	M	161,470
Pinelake Area	44	M	49,521
Locksley Ave.	6	M	10,406
Gough - Market to Bush	147	M	150,916
TOTAL	1,436		1,550,422
Financed by State Gasoline Tax:			
Pine St. - Gough to Presidio	97	M	98,941
Redevelopment Area D-1 - Contract 1	2	M	3,281
Lake Merced Blvd. at Brotherhood	17	M	12,780
Redevelopment Area E-1 - Contract J	2	M	7,149
Palo Alto - Clarendon to Bellbrook	3	M	2,766
Chestnut Drive	5	I	4,000
23rd St. - Indiana to Iowa	5	M	3,112
Pennsylvania - 22nd to 23rd	11	M	15,827
Judah St. - 44th to LaPlaya	16	M	14,134
Aquatic Park - Stage I	24	M	26,760
Redevelopment Area A-2 - Contract A	44	M	48,490
Pacific, Scott, Broadway	47	M	41,506
Green St. - Pierce to Scott	27	M	85,906
North Waterfront Area - Stage I	5	M	3,800
Aquatic Park - Stage II	26	M	42,956
23rd - Indiana to Iowa	3	M	1,251
Robin Hood Drive	8	M	5,329
Fillmore St. - Lombard to Chestnut	11	M	12,107
Hunters Point Area - Stage I	7	M	6,100
Redevelopment Area A-2 - Contract C	21	M	21,290
Pierce Street - Oak to Fell	3	I	4,034
Duboce Triangle	26	M	26,670
Front Street	1	M	1,842
TOTAL	409		490,031
GRAND TOTAL	1,845		2,040,453

Notes: (a) M - Mercury Vapor

I - Incandescent

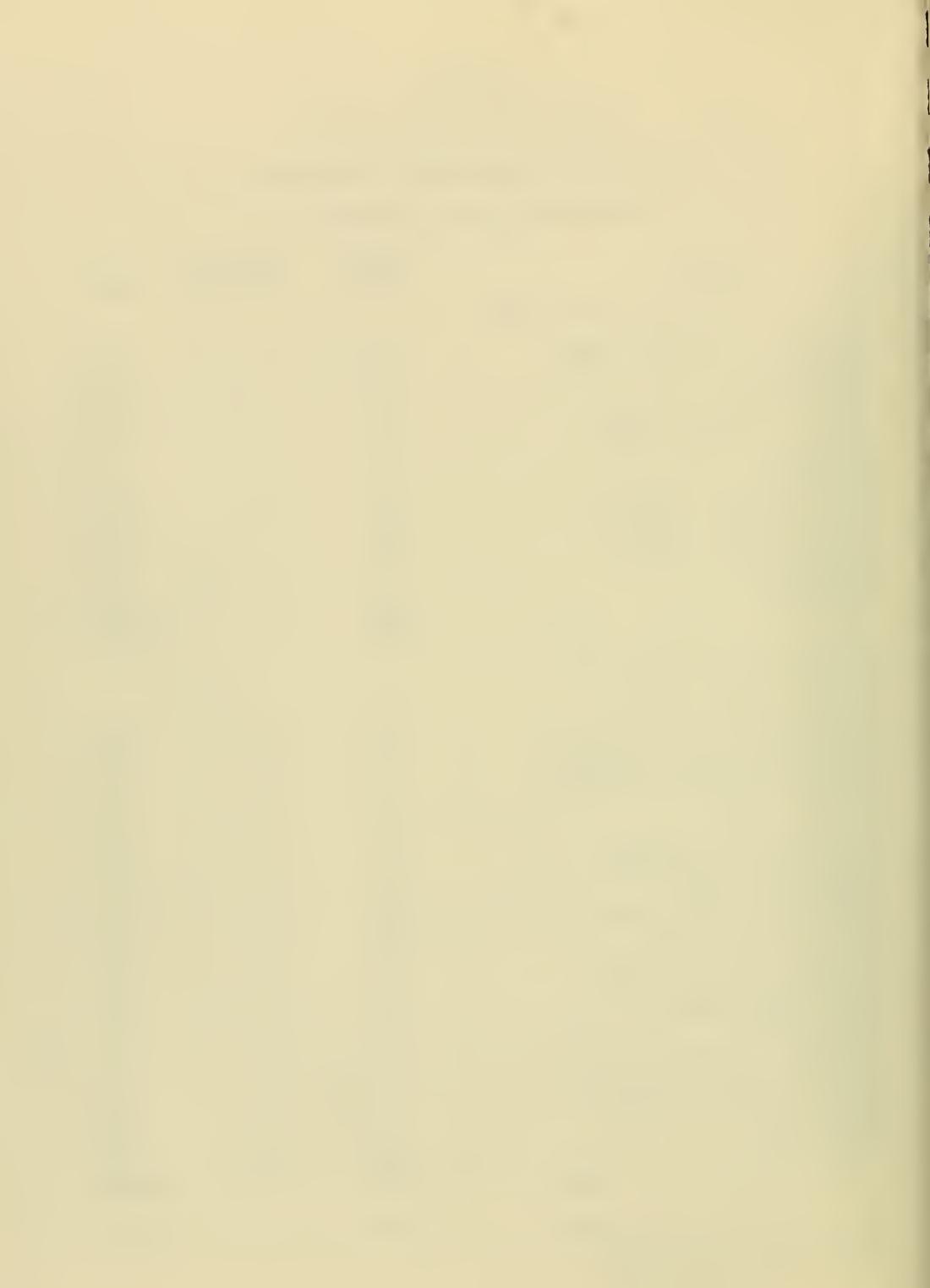


TABLE 17

BUREAU OF LIGHT, HEAT AND POWER

HISTORICAL COST OF CITY-OWNED STREET LIGHTING IMPROVEMENTS

Fiscal Year	Ad Valorem Taxes	Gasoline Taxes	Street Lighting Bonds	Property Owners	State Highway Dept.	Miscellaneous Sources*	Total
Prior to July 1, 1953							
1953-54	\$1,748,675	\$ 617,115	-	\$576,404	\$ 22,650	\$477,651	\$ 3,442,495
1954-55	142,151	22,181	-	23,495	2,274	1,239	191,340
1955-56	155,727	30,817	-	748	16,578	543	164,413
1956-57	15,704	48,620	-	2,484	19,181	1,360	87,349
1957-58	114,168	26,641	-	7,256	-	3,003	151,068
1958-59	2,501	64,942	-	18,199	4,142	-	89,784
1959-60	-	171,367	-	10,231	626	558	182,762
1960-61	-	100,126	-	35,874	10,242	4,083	150,325
1961-62	-	82,074	-	19,236	-	1,865	103,175
1962-63	-	200,113	-	116,376	24,550	7,993	349,032
1963-64	-	84,328	-	21,700	-	-	106,028
1964-65	-	340,108	-	32,556	6,000	-	378,664
1965-66	-	97,846	-	8,975	50,857	-	157,678
1966-67	-	474,673	\$ 522,899	-	-	-	997,572
1967-68	-	111,164	-	188,312	5,000	-	304,476
1968-69	-	175,949	-	331,941	-	-	507,890
1969-70	-	374,229	-	616,722	40,250	-	1,031,201
1970-71	-	359,635	-	261,000	-	-	620,635
TOTALS	\$2,138,926	\$3,871,959	\$3,471,316	\$878,534	\$197,350	\$498,275	\$11,056,340
LESS:	Cost of portions removed prior to fiscal year 1969-70						825,909
	Cost of portions removed during fiscal year 1970-71						32,000
Original Cost of City-Owned Facilities in Service	June 30, 1971						\$57,909
*Includes WPA and PWA (1935-1942), Boulevard Construction (1932-1934), Municipal Transit System, Park and Recreation, and Housing Authority.						\$10,198,431	

TABLE 18
ITCHIEG WATER AND POWER
CONSTRUCTION CONTRACTS
FISCAL YEAR 1970-71

<u>Contract No.</u>	<u>Description</u>	<u>Contractor</u>	<u>Contract Time Completed</u>	<u>Original Contract Price</u>	<u>Value of Work Done During Fiscal Year</u>
HII-399	Red Mountain Bar Wasteway Alterations	OBO Contractors and Engineers	9-8-69	\$ 3-5-71	\$ 63,650 \$ 4,677
HII-414	Repairs to Early Intake Dam	Thomas Construction Co.	8-31-70	4-1-71	77,910 33,104
HII-420	Moccasin-Newark Transmission Line - Paint Steel Towers (402N to 763N)	Clinton A. White Painting Company	5-16-70	8-20-70	13,910 5,374
HII-425	Moccasin Reservoir Bypass	Glanville Construction Co.	5-24-71	---	1,028,168 1,028,168
HII-426	Moccasin diversion Conduit Repair Invert Liner Plates	Dalzell Corporation	10-12-70	10-21-70	57,200 35,750
HII-427	Paint Cottage - Cakdale Yard	John A. Houston	6-12-70	7-29-70	692 346
HII-428	Restoration of Trolley Overhead on Mission & 16th St.	Abbett Electric Corp.	9-28-70	---	109,278 108,017
HII-429	Construct Mire Residences Early Intake	Hetch Hetchy Water and Power	6-11-71	---	95,000 1,400
HII-430	Extension of Utilities to Three Residences at Early Intake	City Appliance and Electric	6-28-71	---	21,995 ---
HII-432	Seal Coat and road repairs Jones Point to Nather highway 120 to Jerry Lane, Moccasin Village Area, & Surfacing 100' Pavement road	Harold Tower Construction Company	5-17-71	---	91,725 45,365

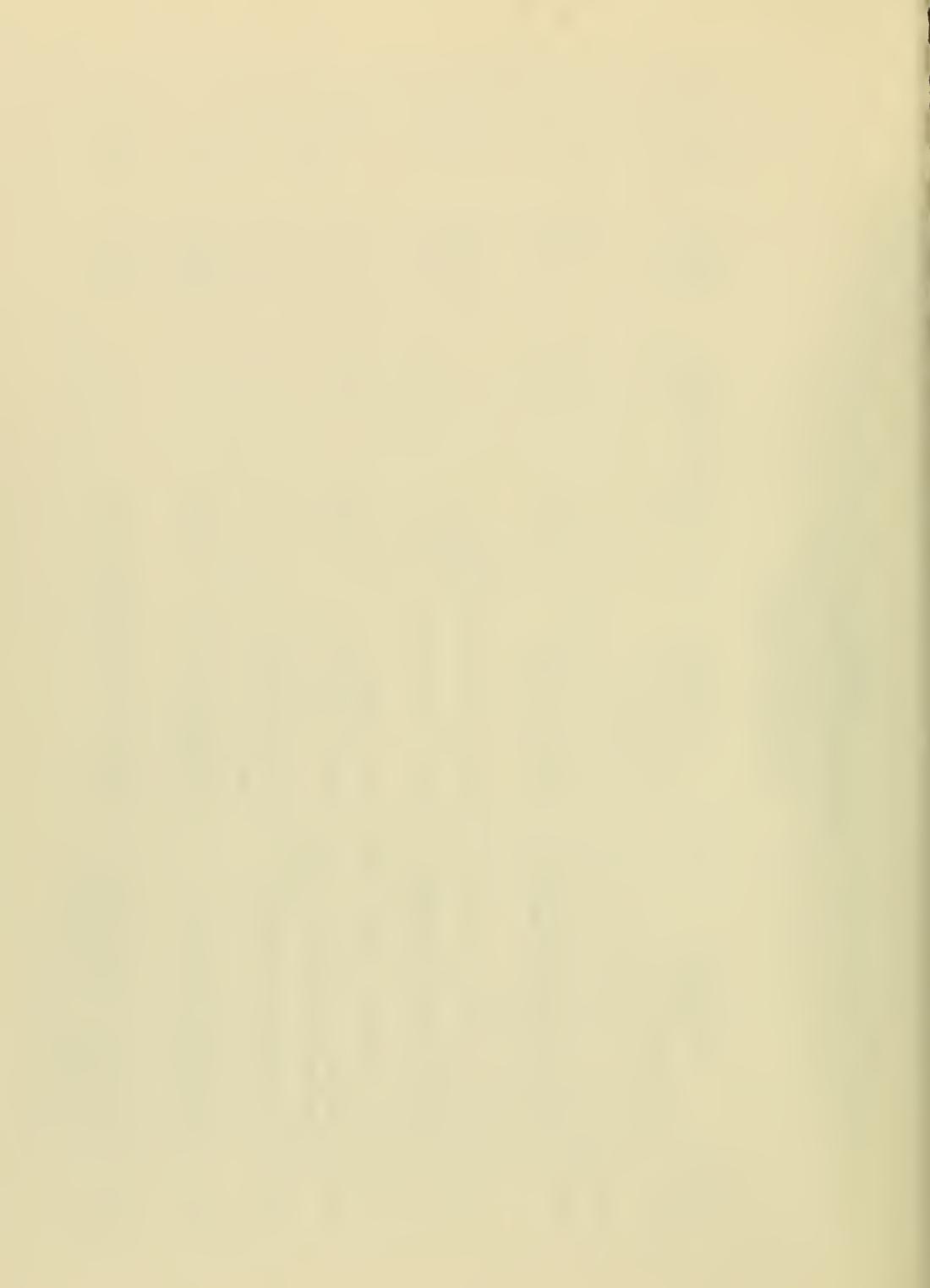


TABLE I8 (Cont'd)
 ILLINOIS WATER AND POWER

CONSTRUCTION CONTRACTS
FISCAL YEAR 1970 - 71

Contract No.	Description	Contractor	<u>Contract Time</u>		Original Contract Price	Value of Work done during Fiscal Year
			Started	Completed		
III-453	Locasain-Newark Transmission Line - Paint Steel Tower (Towers 266N to 458N)	Clinton A. White Painting Company	9-28-70	---	\$ 14,750	\$ 14,455
III-436	Replace Domestic Water System West Portal and Priest Reservoir Resurface Roads Locasain Village	E. H. Norrell Company	5-5-71	6-30-71	15,953	15,953
III-437	Locasain Valve - San Joaquin Pipe Line - Oakdale Portal and Tesla Portal Valve Houses Motorize Valve - San Joaquin Pipe Line - Oakdale Portal and Tesla Portal Valve Houses	George Reed, Inc.	10-19-70	11-10-70	33,457	22,385
III-442	Bryant Substation Office Temporary Timber Fluue Locasain Powerhouse Tailrace	OBCO Contractors and Engineers	6-1-71	---	28,280	---
III-444	Cottage No. 1 O'Shaughnessy Barn Renovate and Repair	Hadden Construction Co.	2-22-71	4-24-71	4,440	4,440
III-446	Transmission Line Relocation at Ted Mountain Bar (115 KV Locasain-Newark Line)	Charles I. Cunningham Company	5-1-71	3-30-71	39,235	42,165
III-449	Charles I. Cunningham Company	5-3-71	---	3,888	1,175	
III-451	Slater Electric Company of California Inc.	5-9-70	7-6-70	155,661	11,127	

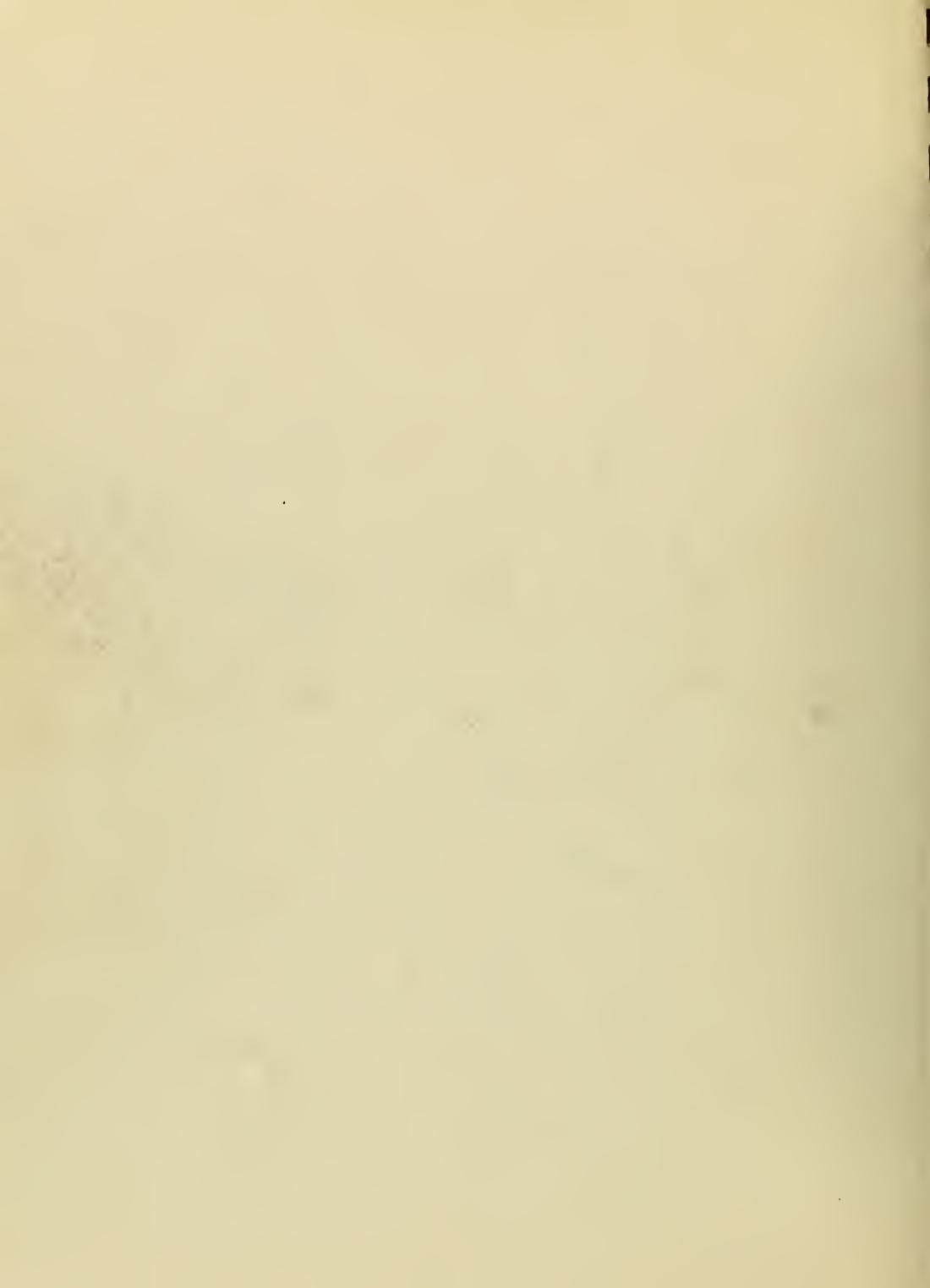
TABLE 18 (Cont'd)
HETCHY WATER AND POWER

CONSTRUCTION CONTRACTS
FISCAL YEAR 1970 - 71

<u>Contract No.</u>	<u>Description</u>	<u>Contractor</u>	<u>Contract Time Started</u>	<u>Contract Time Completed</u>	<u>Original Contract Price</u>	<u>Value of Work Done During Fiscal Year</u>
Emergency Repairs to Lloccasin Penstock Supports	Pressure Grout Company	11-2-70	12-16-70	\$ 40,000	\$ 24,047	
Emergency Repair Generator No. 2	Hetch Hetchy Water and Power	2-19-71	3-31-71	110,000	110,208	
	Total Amount of Hetch Hetchy Contract Work Performed During Fiscal Year				\$ 546,961	
	Value of City Furnished Material Contract No. 111-428 - Restoration of Trolley Overhead on Mission & 16th Streets				\$ 18,787	
						\$ 565,748

TABLE 19
HETCH HETCHY WATER AND POWER
PURCHASE ORDERS FOR EQUIPMENT
FISCAL YEAR - 1970 - 71

Purchase Order No.	Description	Contractor		Contract Time Completed	Original Contract Price	Value of Work Done During Fiscal Year
		Started	Completed			
97984	Hydraulic Impulse Turbine for Moccasin Powerhouse	Hitachi New York, Ltd.	3-11-65	3-12-71	\$1,211,402	\$ 113,556
R-70155	Synchronous Generators for Moccasin Powerhouse	Ferrostaal Pacific Corporation	1-18-66	---	807,266	Emergency Repairs Only
R-63758	Synchronous Generators for Moccasin Powerhouse	Ferrostaal Pacific Corporation	1-18-66	---	1,050	---
Total Amount of Work Done Under Hetch Hetchy Purchase Orders During Fiscal Year						\$ 113,556

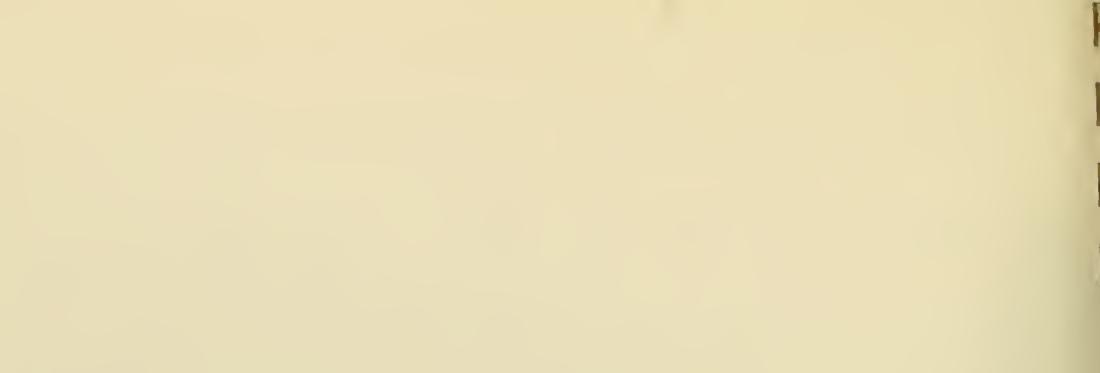


1971 ANNUAL REPORT 1972

HETCH HETCHY WATER AND POWER



PUBLIC UTILITIES COMMISSION
CITY AND COUNTY OF SAN FRANCISCO



CITY AND COUNTY OF SAN FRANCISCO

JOSEPH L. ALIOTO - MAYOR

PUBLIC UTILITIES COMMISSION

MARVIN E. CARDOZA	President
OLIVER M. ROUSSEAU	Vice President
JOSEPH J. DIVINY	Commissioner
H. WELTON FLYNN	Commissioner
LOUIS A. PETRI	Commissioner
JOHN D. CROWLEY	General Manager

DOCUMENTS DEPT.

FEB 7 1980

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HETCH HETCHY WATER AND POWER DEPARTMENT

ORAL L. MOORE - General Manager

This report is respectfully dedicated to Hetch Hetchy employees, past and present, whose devoted and conscientious efforts have made possible these accomplishments for San Francisco.

HIGHLIGHTS - 1971-72

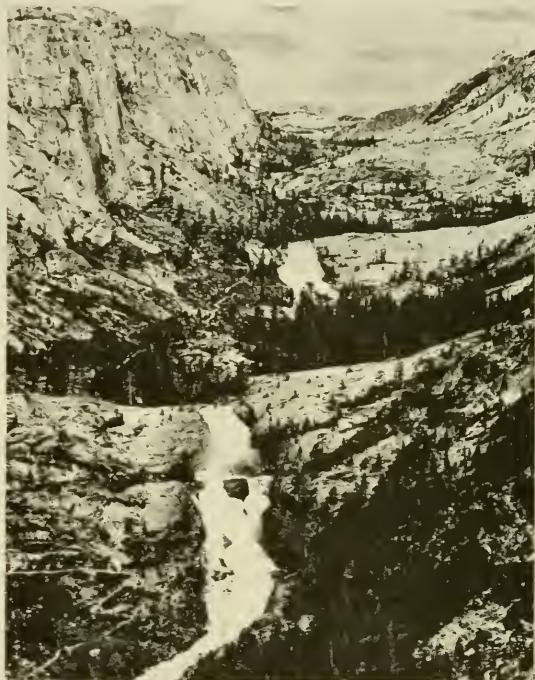
Hetch Hetchy power revenues were \$14,502,230, slightly less than the preceding year. Revenue for sale of water and standby service to the San Francisco Water Department was \$5 million, an increase of half a million dollars.

\$4.06 million in Hetch Hetchy power revenues were appropriated this year for the operation, maintenance and improvement of the electrical facilities of the San Francisco Municipal Railway, thus sparing City taxpayers the payment of this amount as an additional subsidy.

Hetch Hetchy furnished power to the Municipal Railway and all other municipal departments at rates well below those which would have been charged by the Pacific Gas and Electric Company, a further saving to the taxpayers of \$935,000. During the past ten years, electrical consumption for municipal purposes has increased 78.2%.

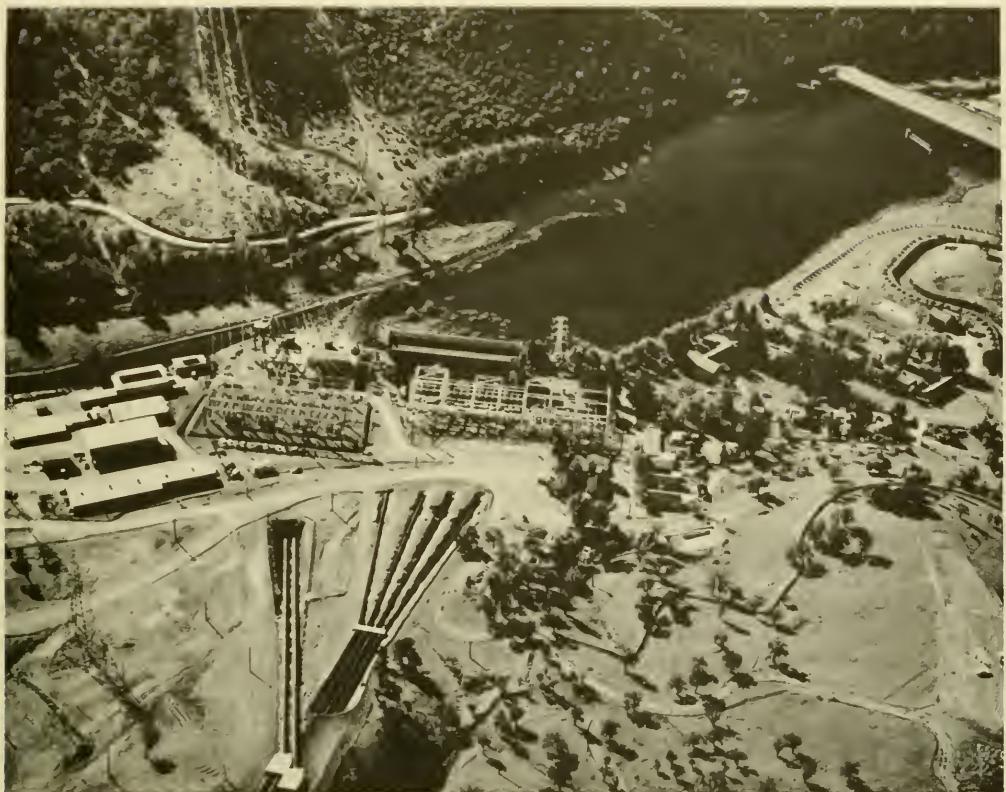
Recreational facilities at new Don Pedro Dam, designed to accommodate more than one-half million recreational users annually, became fully operational this spring.

An all-time record of street lighting improvements was again established. A total of 2,050 new City-owned electrotliers were placed in service at a cost exceeding \$2,350,000. The cost per capita of street lighting, even with more and better lighting, fell still further to \$1.83



GRAND CANYON OF THE TUOLUMNE



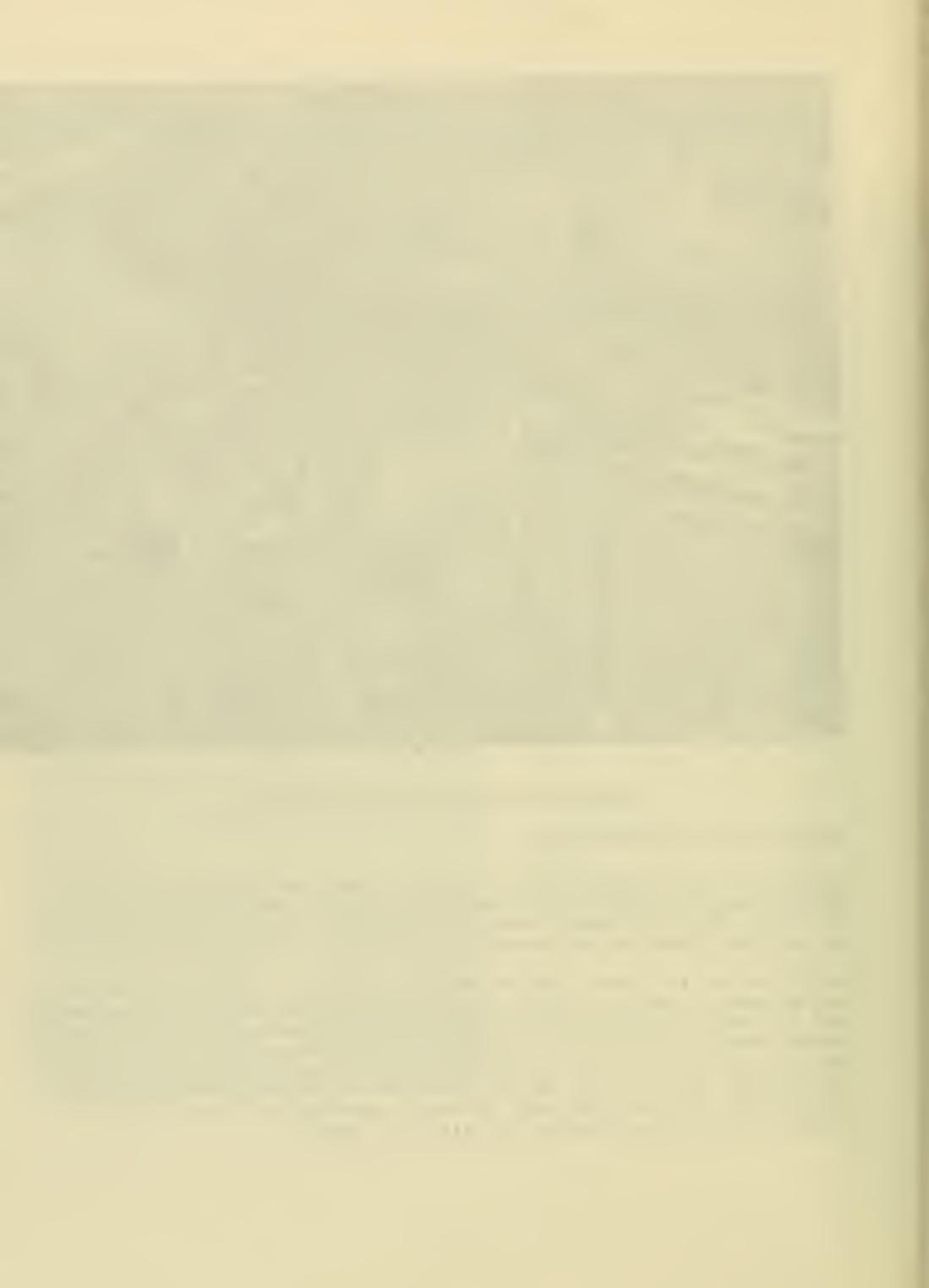


MOCCASIN POWERHOUSE AND RESERVOIR

ORGANIZATION AND FUNCTIONS

Under policies established by the San Francisco Public Utilities Commission, the HETCH HETCHY WATER AND POWER DEPARTMENT and BUREAU OF LIGHT, HEAT AND POWER serve the City and County of San Francisco in the dual function of operating department and service bureau.

Hetch Hetchy is a municipally-owned system of storage reservoirs and aqueducts which collects water from the Tuolumne River watershed and delivers it to the San Francisco Water Department. Approximately three-fourths of the water consumed in San Francisco, and the Water Department service area, comes from this source. As a by-product of falling water, Hetch Hetchy operates and maintains hydroelectric generating stations and high voltage transmission lines for the production and distribution of electric energy.



Through its Transit Power Division, Hetch Hetchy has operated, maintained and provided improvements for the electric facilities of the San Francisco Municipal Railway since July 1, 1969. At that time, the Public Utilities Commission decided to transfer the responsibility for the conversion and distribution of electrical power to streetcars and trolley buses in San Francisco from the Municipal Railway to Hetch Hetchy Water and Power. Now, Hetch Hetchy not only generates and transmits the electrical power from the Sierra Nevada to the Bay Area, as it has in the past, but distributes this power directly to the transit vehicle.

In order to handle this additional responsibility, Hetch Hetchy assumed control of the equipment and personnel of the Overhead Lines and Motive Power Sections of the Municipal Railway. Personnel for this division includes fifty-one employees in twelve different categories. Last year, this responsibility cost Hetch Hetchy, and saved San Francisco taxpayers, \$4.06 million.

All of Hetch Hetchy's expenses, including those of the Transit Power Division, are supported by water and power revenues.

The Bureau of Light, Heat and Power administers contracts for furnishing electric, gas and steam services to municipal departments and handles monthly billings. It also administers contracts for furnishing street lighting services and for operation and maintenance of City-owned street lighting. Financing, design, and construction of City-owned street lighting improvements are under the jurisdiction of Department of Public Works. In accordance with provisions of the City and County Administrative Code, plans for these improvements must be approved by the Public Utilities Commission through this Bureau. The Bureau is financed by appropriations from municipal departments and gas tax funds.

For fiscal year 1971-72, the Department administered budgeted funds for all purposes as follows:

<u>Budget</u>	<u>No. of Employees</u>	<u>Total Amount Appropriated</u>
Hetch Hetchy Water and Power	194	\$ 16,547,137
Hetch Hetchy Water and Power (Transit Power Division)	51	4,132,355
Bureau of Light, Heat and Power	12	6,620,515
TOTAL	257	\$ 27,300,007

HETCH HETCHY WATER AND POWER SYSTEM

REVENUES AND EXPENDITURES

Revenue from Hetch Hetchy Water and Power operations is derived principally from two sources:

1. Sale of electric power and energy to San Francisco Municipal departments, Modesto and Turlock Irrigation Districts in the San Joaquin Valley, and five industrial customers:

Kaiser Cement and Gypsum Corporation	Santa Clara County
Kaiser Aluminum and Chemical Corporation	Santa Clara County
Hercules, Inc.	Contra Costa County
California Ammonia Company	San Joaquin County
Norris Industries, Riverbank	Stanislaus County

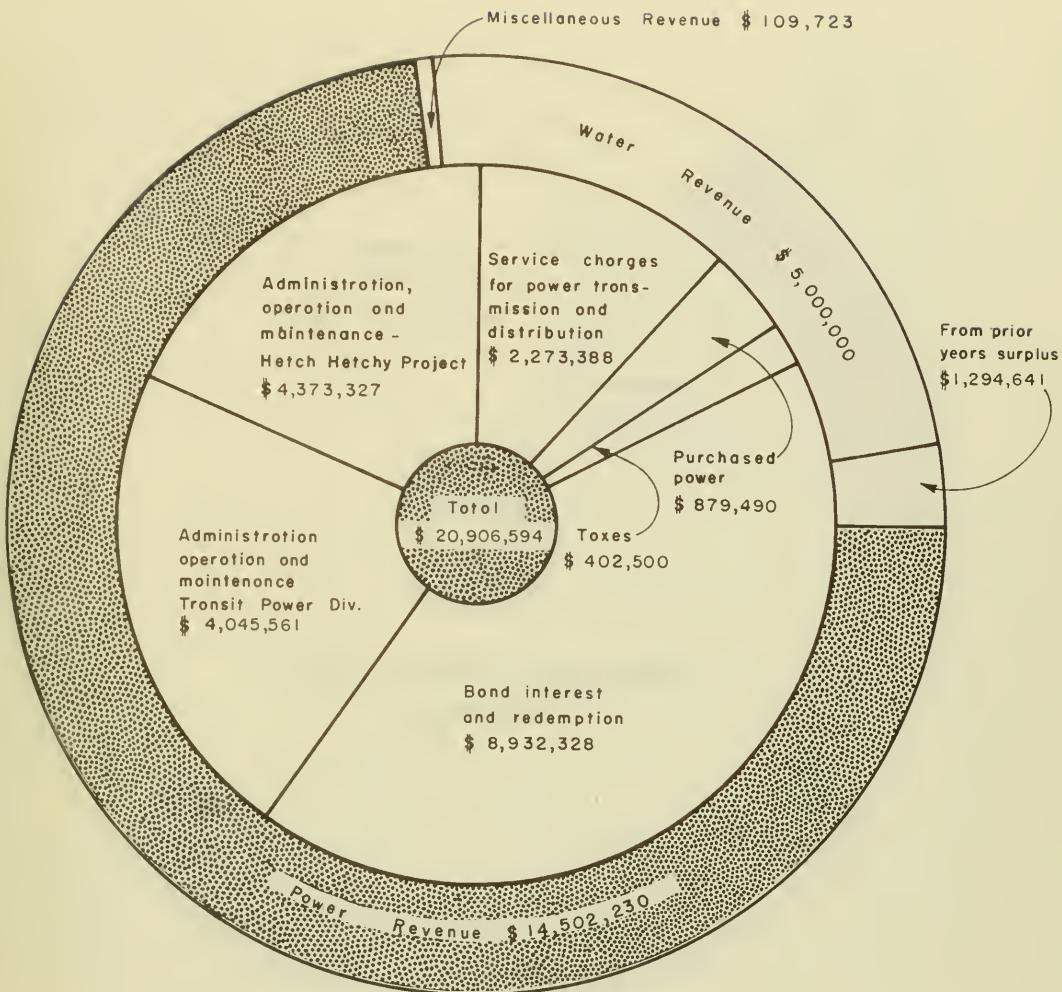
2. Sale of Water to the San Francisco Water Department.

This past year, revenue from sale of water and standby service to the San Francisco Water Department was \$5 million.

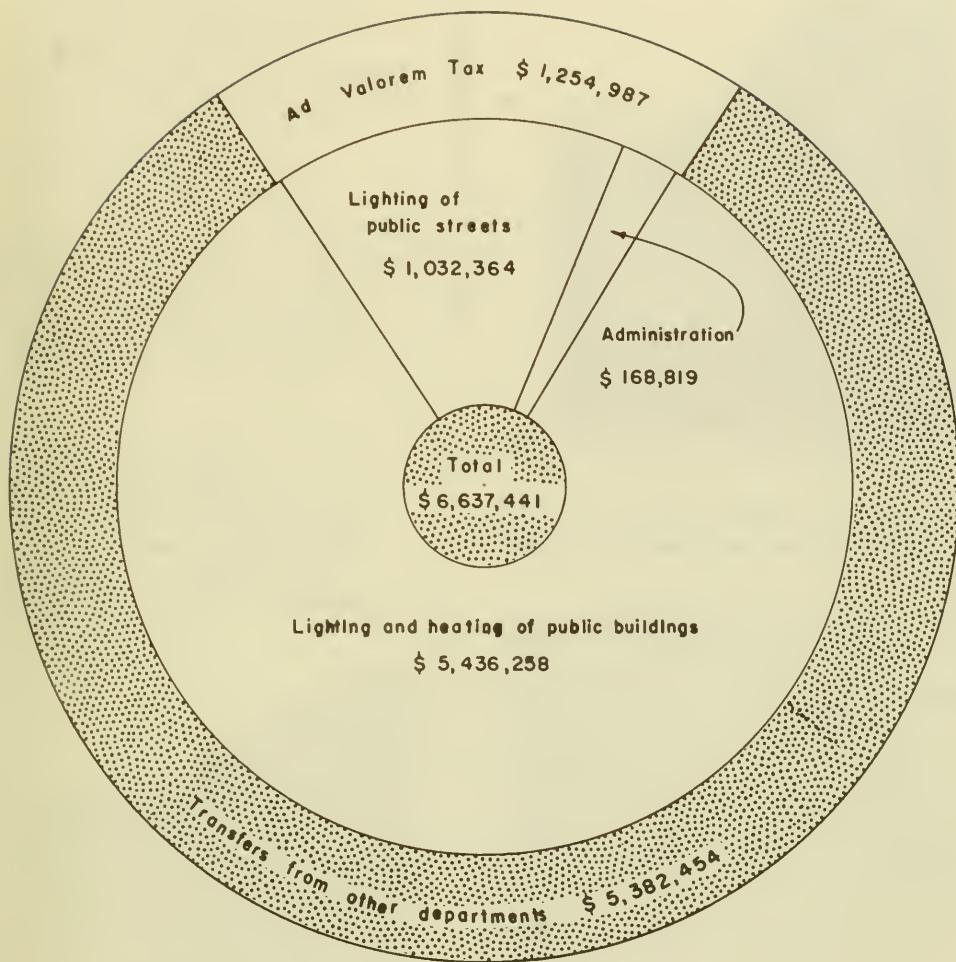
Gross sales of electric energy amounted to \$14,502,230, compared to \$14,983,000 during the year 1970-71. This decrease in electric revenue reflected the decrease in actual sales during the year; 1,978,800,000 kilowatthours, as compared to 2,065,245,250 kilowatthours for 1970-71.

Revenue for service orders, rentals, meals and miscellaneous items totaled \$109,723.

Expenditures are summarized on the pie chart following, and are detailed in the appendix.



HETCH HETCHY REVENUES
AND EXPENDITURES
FISCAL YEAR 1971-72



BUREAU OF LIGHT, HEAT AND POWER

REVENUES AND EXPENDITURES

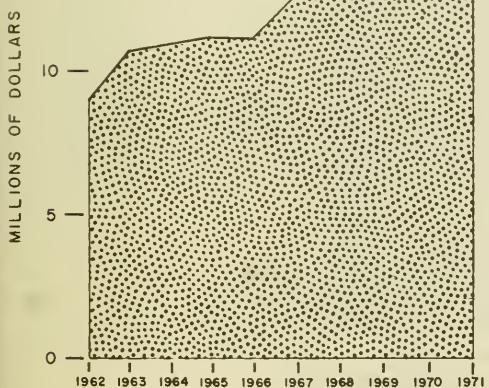
FISCAL YEAR 1971-72

POWER SALES

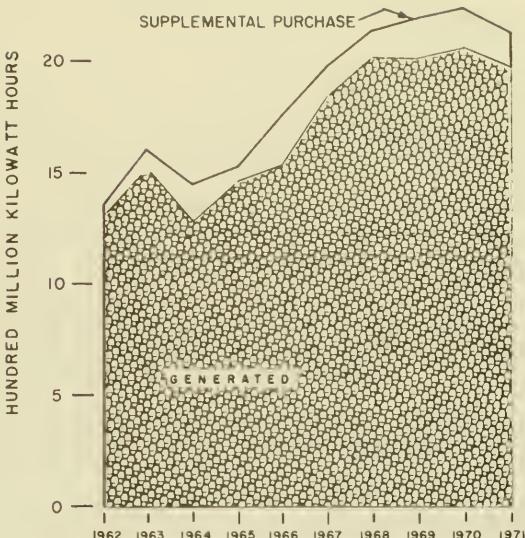
Power and energy delivered to all City Departments increased 4.4% over the previous year, nearly three-quarters of which is accounted for by the San Francisco International Airport. Although the increase was not as spectacular as the 14.1% for 1970-71, the 8.3% increase by the Airport for 1971-72 indicates that its facilities are still undergoing expansion to meet the ever changing requirements of the new and larger jet liners.

Hetch Hetchy power is sold to City Departments at cost, representing a saving to taxpayers for 1971-72 of approximately \$935,000, compared to the cost if supplied by local investor-owned utility.

15 —



REVENUE FROM SALE OF ELECTRIC ENERGY



HETCH HETCHY
ENERGY GENERATION AND PURCHASE

Power and energy delivered to Modesto Irrigation District, Hetch Hetchy's largest power customer, and to Turlock Irrigation District, the third largest, increased by 9.4% and 12.2% respectively this year. These increases mark the steady load growths which the two Districts are still experiencing. However, these increases would have been on a smaller scale had the impounding of water at the Districts' new Don Pedro Reservoir met with more favorable water conditions the past year.

Gross sales of electric energy amounted to \$14,502,230 compared to \$14,983,447 during 1970-71. This decrease in electric revenue is related to a 4.7% decline in total generation at the Hetch Hetchy powerhouses resulting from

the subnormal precipitation on the Tuolumne River watershed this past fiscal year. This decrease in generation also accounted for the increase in expenditure for supplementary power and energy from \$573,059 to \$879,490.

WATER PRODUCTION AND TRANSMISSION

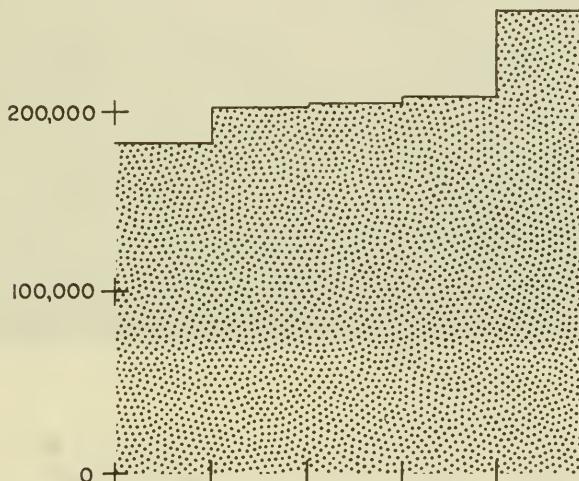
Precipitation recorded for the year at our measuring stations was 71 percent of average.

During the year, 83,527,100,000 gallons of water were diverted from the Tuolumne River watershed through the Hetch Hetchy Aqueduct to the San Francisco Water Department, representing 89 percent of the City's total customer consumption. In addition, 229,700,000 gallons were delivered to the United States Atomic Energy Commission at Mocho Shaft of the City's Coast Range Tunnel for use at the Lawrence Radiation Laboratory at Livermore; 43,736,308 gallons were delivered to Groveland Community Service District in Tuolumne County.

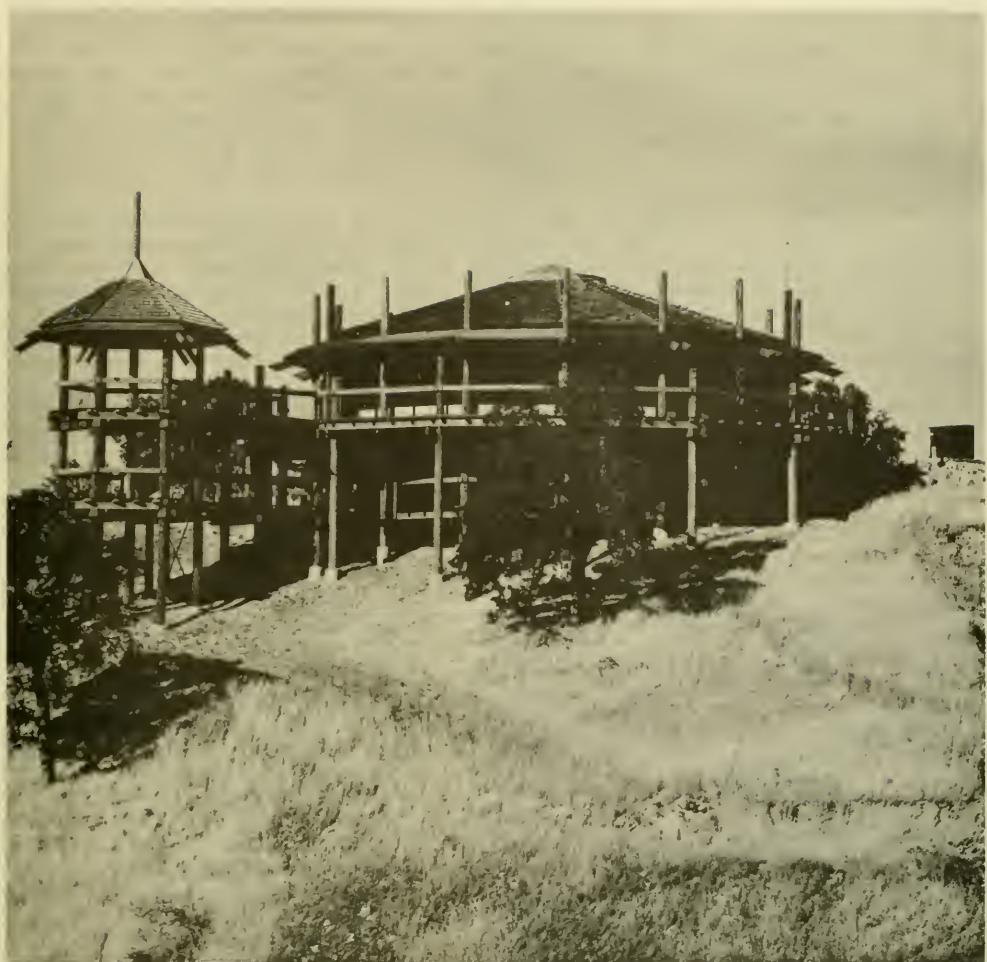
Appendix Table 6 shows comparative data on precipitation, runoff, storage and delivery of the Hetch Hetchy Water Supply System.

Acre Feet
Delivered
To SFWD

300,000 +



DELIVERIES OF WATER TO
SAN FRANCISCO WATER DEPARTMENT



HEADQUARTERS - VISITORS CENTER - LAKE DON PEDRO

DON PEDRO RECREATIONAL FACILITIES

The new Don Pedro Dam, completed in 1971 by the three constructing agencies, the City and County of San Francisco and the Turlock and Modesto Irrigation Districts, not only will provide the many benefits stemming from the irrigation, flood control and power aspects of the project, but will provide tremendous recreational benefits for all the people of California.

Outdoor recreation is a new activity in the agencies' portfolio of meeting agricultural, community and metropolitan needs for water and power. The inclusion of an outdoor public recreation program through the cooperative efforts of the three agencies, the State of California (through the Davis-Grunsky Act which provided for the recreation facilities and boat-launching ramps), and the Federal Government, as well as Tuolumne County, is a noteworthy accomplishment.

Hetch Hetchy, under terms of the agreement with Turlock and Modesto Irrigation Districts, provides financial support for the recreational facilities by means of an annual assessment which is established at 51.7121% of the deficit (the difference between operating costs and revenue) which occurs from the recreational operation of the Don Pedro Project. For

fiscal year 1971-72, this assessment was \$17,982.68.

It is estimated that the assessment for Hetch Hetchy for 1972-73 will be \$50,000.

Although the total gate receipts of the Don Pedro Recreation Agency (the agency which was created by the aforementioned agencies to manage the recreational facilities) are still small, the increase from June 1971 to June 1972 was almost 500%. Indications are that this trend of rapidly increasing receipts will continue for many years, as the lake rises and the public becomes more aware of the new facilities.

This should result in a decrease in and, it is hoped, the eventual elimination of the annual assessment altogether.



BOAT LAUNCHING RAMP, FLEMING MEADOWS
LAKE DON PEDRO

Currently, there are three highly developed recreational areas on the lake containing nearly 630 camping, picnicking and trailer spots, complete with modern sewage treatment facilities.

On the east side of the dam, at Fleming Meadows which is located just north of La Grange, there are 130 picnic units, 125 tent camp units, 90 trailer units with hookups, a fish cleaning station, a boat launching ramp, a trailer sewage disposal station and various other recreational facilities, including a completely treated two-acre swimming lagoon and a group picnic facility.

The Lake Don Pedro Marina, Inc., a corporation made up of Turlock business and professional people, now in operation at Fleming Meadows, has 150 open and covered slips now in use with more planned for the future.

Buoyed cables provide tie-up and services for nearly 100 houseboats. In addition to gas, oil, water, telephone and sewage pump-out services, there are concession snack bars and stores supplied with the varieties of goods and other services needed by those using the camping, fishing and boating facilities. Houseboats, along with boats for fishing and water skiing, are available for rental.

The second area near the dam is called Mexican Gulch and is located on the western shore of the lake off of County Road J-59. It contains 187 tent camp units, a trailer sewage disposal station, and a fish cleaning station.

The Moccasin Point area on Yosemite Highway No. 120 has 20 picnic units, 62 tent camp units, 13 trailer units with hookups, a trailer sewage disposal station, a boat-launching ramp and a fish cleaning station. This is a convenient overnight camping place for tourists visiting historic places along the Mother Lode Highway No. 49, or going to the Stanislaus National Forest and Yosemite National Park.



CAMPING SPOT - LAKE DON PEDRO

The Headquarters-Visitors Center which is situated on the west side of the dam provides an outstanding overlook of the lake, the dam, and the San Joaquin Valley, as well as the adjacent foothill and mountainous country.

The lake offers excellent fishing opportunities, as it is well stocked with many varieties of fish. These include black bass, rainbow and eastern brook trout, Kokanee salmon, crappie and catfish. Since the completion of the new reservoir, almost one million fingerling trout have been stocked in the main Tuolumne River at the headwaters of the lake. Also, about 25,000 silver salmon are scheduled for planting in 1973. With the tremendous increase in shore line and additional food areas, the deeper and colder water, along with the many warm water inlets and coves, this lake should offer excellent fishing waters in the years ahead.

Don Pedro is located in a section of the Mother Lode Country rich in history and traditions associated with the early gold rush days of California. Visitors to the lake and campgrounds are within easy reach of such interesting historic communities as Columbia, Sonora, Jamestown, Knight's Ferry, Chinese Camp, Coulterville and La Grange.

The lake is readily accessible to millions of people within two hours or so driving time. It is less than an hour from Modesto, Turlock, Merced, Oakdale and Sonora, an hour from Stockton, and a little over two hours from Sacramento, Fresno and the San Francisco Bay Area communities. Approximately 40% of the visitors come from adjacent San Joaquin Counties, 40% from the San Francisco Bay Area and Coastal Counties, and the balance from adjacent mountain counties and Southern California.



MARINA - FLEMING MEADOWS
LAKE DON PEDRO



TRANSIT POWER DIVISION

The Transit Power Division is responsible for supplying the 600-volt direct current power that is necessary to operate the streetcars and trolley coaches of the San Francisco Municipal Railway.

The Transit Power Division is composed of two sections - the Motive Power Section and the Overhead Lines Section.

Motive Power Section

The Motive Power Section operates and maintains seven substations which convert electric power from 12,000 volts alternating current to 600 volts direct current by means of motor-generators, synchronous converters, and mercury arc rectifiers. (See Appendix Table 3 for statistical data.) Motive Power is also responsible for maintaining the electric motors and associated control equipment for operating the cable-winding machinery located in the Cable Car Powerhouse at Washington and Mason Streets. In addition, Motive Power is also responsible for periodic inspection, cleaning, adjusting and repairing the streetcar and trolley coach recorders at Central Control of the Municipal Railway.

The substations operate 24 hours per day, 7 days per week, 365 days per year.

The insulation of all the motor-generators and synchronous converters in the manually-operated substations has deteriorated to the point that it is very dry and brittle. Since March 1972, four machines have been removed from service for inspection and cleaning, and then the insulation was spray-painted with clear Glyptal, in hopes of prolonging the life of the machines until they can be replaced with modern rectifier substations.

Overhead Lines Section

The primary function of the Overhead Lines Section is to maintain, in satisfactory operating condition, the trolley wire overhead facilities and the electric distribution system which conveys power to it.

Overhead facilities are systematically inspected, and worn or damaged parts are replaced before they can cause accidents or malfunctioning of equipment. Also, damaged trolley support poles were straightened and reinforced to avoid costly replacement. Trolley support poles, which were needed to support street lights, were extended and/or relocated for more efficient street light coverage.

The Overhead Lines Section repaired 15 cases of damage to the trolley overhead facilities and/or the electric distribution system, and the parties responsible for the damage were billed a total of \$10,069.41. The City was reimbursed for 11 of the cases, totaling \$9,195.45, by the end of the fiscal year.

The Overhead Lines Section also performed work for building owners and contractors under work orders amounting to \$30,974.98. This work included moving trolley poles to accommodate driveways; relocating trolley poles and feeders to permit construction of new buildings; temporarily removing trolley wires and feeders to permit passage of high loads; and shifting of trolley wires and feeders for various excavations.

The Overhead Lines Section engaged in many other activities of a related nature which it is especially equipped to perform. These additional duties included repairs, maintenance and construction of electrical systems in Muni's car barns, offices and shops; welding and rebuilding of worn overhead lines special work; making and rebuilding parts for switches, warning block signals, car recorders, and strand alarms for the cable car system; installing mobile radio equipment; installing streetcar and bus stop signs and public information signs.

ENGINEERING

The Engineering Division of Hetch Hetchy Water and Power provides engineering services for the Hetch Hetchy Project and the Transit Power Division. These services include the preparation of studies, reports, cost estimates, and plans and specifications for new construction, for replacement of structures and for items of major maintenance. Surveying, inspection of construction, contract administration and payment recommendations are provided for all construction work under Hetch Hetchy Water and Power. Scheduling of new facilities, construction and major maintenance is done by the Engineering Division. Specifications for procurement of major or unusual items of equipment are also prepared by the Division. Work of unusual magnitude or which requires special knowledge and expertise is done by engineering consulting firms which have the necessary manpower and qualifications. Recommendations as to the firms which are so qualified are made by the Engineering Division. Upon approval of a firm by the Public Utilities Commission, the Division prepares the necessary agreements and contracts and reviews and approves the work of the consultants.

The Engineering Division is organized into four main sections: Structural and Civil, Electrical and Mechanical, Architectural and Construction.

During the year, plans and specifications were prepared for the following work:

HH-424 - Powerhouse Flow Meter Plumbing

Plans and specifications were prepared to correct flow meter problems in Kirkwood and Moccasin Powerhouses. Bids for this project came in too high; therefore, the bids were rejected and the work was done by City forces at Moccasin.

HH-431 - Repairs to Dion R. Holm Penstock

To protect the penstock, rock slides in the penstock ditch were removed, concrete trench lining was repaired, and the steel penstock was painted where required.



DION HOLM PENSTOCK AND POWERHOUSE

HH-439 - Clearing Transmission Lines - Rights-of-Way

Tall and fast-growing vegetation was removed. Bushes eight feet high and under were allowed to remain to cushion possible fall of conductors and to help prevent fire.

HH-441 - Additions to Truck Port and Washing Facilities - Moccasin

Moccasin shop facilities were improved to eliminate open storage of vehicles and to provide capability for daily washing of automatic equipment.

HH-445 (Inf.) - Outer Mission Substation Car Guard - Repair, Paint

A guard was erected to eliminate vandalism, unauthorized parking of cars, and resultant damage to buildings. The exterior of the substation was repaired and painted.

HH-447 - Installation of Post Street Trolley System

A contract was started to install overhead trolley wires to accommodate new one-way street patterns.

HH-452 - Improvements to Storm Drainage System at Moccasin

A contract was let for work to prevent storm runoff around the Moccasin shops and powerhouse from entering the San Francisco water supply.

HH-453 - Holm Powerhouse - Paint Interior

A contract was let to paint the interior of Holm Powerhouse as part of a program of preventive maintenance.

HH-454 - Reconstruct Disposal Field - Moccasin

The existing sewage disposal facilities at Moccasin are in very poor condition, and the existing bypass system diverts raw sewage directly into Moccasin Creek. Application was made for a Clean Water Grant, enabling installation of a modern treatment plant.

HH-455 and HH-465 - Moccasin-Newark Transmission Line -
Paint Steel Towers

These are part of a continuing program of preventive maintenance to paint about 25 steel towers per year.

HH-456 - Resurface Mather-Hetch Hetchy Road

The road between Mather and Hetch Hetchy was resurfaced to prolong the life of the existing pavement.

HH-457 - Cottage No. 4, O'Shaughnessy Dam - Renovate and Repair

Work done on Cottage No. 4 at O'Shaughnessy Dam included remodeling of the bathroom, insulation of ceilings and painting of the interior.

HH-458 - Relocation of Moccasin-Newark Transmission Line Tower No. 970 in Fremont

Relocation of Moccasin-Newark Transmission Line, Tower No. 970 in Fremont, was necessitated by conversion of two-lane Durham Road into a four-lane expressway. Work was done at the expense of the City of Fremont.

HH-459 - Replacement of Electric Substation - Alameda Portal

Obsolete small transformers were replaced with new larger units suitable for current needs.

HH-460 - Moccasin Dam Area Roadway Lighting

A contract was let to replace existing roadway lighting fixtures with improved luminaires and to install underground wiring in place of present overhead wires.



MOCCASIN-NEWARK TRANSMISSION LINE TOWER

HH-461 - Improvements to Domestic Water Supply System at Moccasin

A contract was started to install a more dependable water system using water from the cooling water sump in the powerhouse rather than from the high pressure penstocks. Chlorination will be added. The new Don Pedro Project provides funds for extension of the water supply to the recreation area.

HH-462 (Inf.) - Install Heating System in Tesla Portal Residence

A contract was let for installation of a new central heating system in Tesla Portal residence. Construction of additional rooms made the old floor furnace inadequate.

HH-463 - Install Underground Feeder Cables - Mission Street - Second to Fourth Street

Plans and specifications were completed for a contract to underground overhead trolley feeder cables on Mission Street in the vicinity of the proposed Yerba Buena Center to make way for sewer relocation and to eliminate overhead feeder cables in front of new improvements.

HH-464 - Replace, Repair and Paint Steel Trolley Poles

Plans and specifications were completed for a contract to replace, repair and paint steel trolley poles on California Street as part of a continuing program of preventive maintenance.

The Engineering Division worked closely with Bechtel Corporation to determine operating and design criteria for the new system and to provide basic data on present system.

Monthly generating schedules were prepared for the optimum operation of Holm, Kirkwood and Moccasin hydroelectric plants. Metering and billing were done for industrial electric power customers of Hetch Hetchy, including the Modesto and Turlock Irrigation Districts.

Numerous meetings and conferences were attended with the Transit Task Force and BARTD to discuss and resolve the many problems of the Municipal Railway power facilities coordination with BARTD and with the Market Street beautification program.

The Construction Section provided field surveys, construction inspection and contract administration for some eighteen contracts and projects as tabulated hereinafter.

STREET LIGHTING (Bureau of Light, Heat and Power)

The lighting of public streets within the City of San Francisco is provided by facilities which are, on a City-wide basis, 39.9% owned by the City; 57.5% owned by the Pacific Gas and Electric Company; and a small percentage, 2.6%, jointly owned. In the underground areas, where the economic advantage of City ownership is greatest, 78.3% of the lights are City-owned. Five years ago, the corresponding figure was 65.6%.

The cost to install street lights has increased by only 38% in the last twenty-five years. The average cost to install a street light in 1947 was \$831; the average cost for the fiscal year 1971-72 was \$1,147.

During fiscal 1933-34, the cost for street lighting was \$1.25 per capita; last year, with almost thirty times as much light on the streets and public thoroughfares, the cost per capita was approximately \$1.83.

Maintenance and repair of City-owned installations was performed under two contracts. One provided for group replacement of lamps in accordance with schedules developed by the Bureau. A second contract covered work required for repair of damaged and defective equipment, painting, and miscellaneous maintenance.

Under contract, the Pacific Gas and Electric Company furnished street lighting service as directed, including the furnishing,



LINCOLN WAY - STREET LIGHTING

maintenance and operation of Company-owned facilities. Certain services were provided also for City-owned facilities, including switching and control, replacement of individual lamps and globes, and emergency work required during other than normal working hours.

Electric energy for all City and Company-owned street light operation was supplied by the Hetch Hetchy power system.

Engineering

The Bureau reviews, recommends changes, approvals or rejections of and correlates all street lighting installations, including that done by the Department of Public Works, the Pacific Gas and Electric Company, the Bay Area Rapid Transit District, the State of California, subdividers, etc.

During the fiscal year 1971-72, 26 street lighting contracts involving a total of 912 new street lights, were approved by the Public Utilities Commission. Plans were submitted for approval only after careful checking to determine that illumination will exceed the minimum requirements established by the American National Standards Institute; and that all materials used, and manner of installation meet with the applicable local, state and federal rules, regulations and statutes governing the installation of electrical work.

Operation and Maintenance

As of June 30, 1972, a total of 36,592 City-owned and Company-owned street lights were in service in public streets, parks, viaducts, overcrossings, tunnels and underpasses. A summary of the number and types of units in service at the end of the fiscal year is shown in Appendix Table 14.

A total of \$1,185,958 was expended for operation, maintenance and repair of the street lighting system. Of the total cost, \$12,128 was paid by the State for its share of the operation and maintenance of street lighting at intersections on City streets which are part of the State highway system.

During the fiscal year, there were 110 accidents involving damage to City-owned street lighting property. Investigation was made, as soon as possible, to remove hazards to the public and obstructions to traffic. Total cost of repairs to damaged City-owned street lighting property was \$43,410. Every effort was made to secure reimbursement for damages incurred from responsible parties. Previous experience indicates that approximately three-fourths of the repair costs will be recovered.

Complaints

During the year, 101 complaints requiring field investigation were received and acted upon. These complaints concerned inadequate illumination, objectionable glare in windows, and requests for temporary and permanent relocation of street lighting poles.

Improvements

During fiscal year 1971-72, an all-time record for street lighting improvements was established. A total of 2,050 new City-owned electroliers were placed in service at a cost of \$2,351,545. Improvements were financed through the 1964 Street Lighting Bond Issue and through the Road Fund, as indicated in Appendix Tables 16 and 17.

UTILITY SERVICES TO MUNICIPAL DEPARTMENTS

General

Electric energy supplied to municipal departments is generated on the Hetch Hetchy power system and delivered to various service points by transmission and distribution facilities of Pacific Gas and Electric Company under a wheeling contract. Natural gas and steam supplied to municipal departments are furnished by the Pacific Gas and Electric Company under a service contract.

Municipal Consumption of Electricity, Gas and Steam

During the fiscal year, 478,105,789 kilowatthours of electrical energy was consumed through 921 municipal accounts at an expenditure of \$4,801,078. A saving of \$1,276,236 was realized as a result of purchasing Hetch Hetchy energy as compared to commercial rates. Of the above 160,587,573 kilowatthours of energy was supplied to the San Francisco International Airport for resale to tenants at a cost of \$1,373,166.

During the past ten years, electrical consumption for municipal purposes has increased by 78.2 percent.

Natural gas consumption was 20,195,971 therms through 543 accounts at a cost of \$1,118,001. One account consumed 2,389,700 lbs. of steam at a cost of \$4,241.

A summary of consumption and expenditures for these commodities is shown in Tables 12 and 13.



Bob Mims Bob Moulton



Ardean Heyer

Agnes Hughes



Richard Szeto



Robert Collins



Blaire Froehle

AT WORK



Jeanne Wilson Ronald Ciraulo



Lonnie Lawson

Photos by
Rilla

A P P E N D I X

TABLE 1

HETCH HETCHY WATER AND POWERCOMPARISON OF BUDGETED AND ACTUAL EXPENDITURES (INCLUDING ENCUMBRANCES)FISCAL YEAR 1971-72

<u>OE</u>	<u>DESCRIPTION</u>	<u>BUDGET</u>	<u>ACTUAL</u>	<u>-UNDER, OVER</u>
110	Permanent Salaries	\$ 660,401	\$ 582,008	\$ -78,393
111	Allowance for Overtime	14,628	21,562	6,934
112	Allowance for Holidays	6,128	3,960	-2,168
113	Extended Work Week	6,102	2,127	-3,975
120	Temporary Salaries	43,152	48,099	4,947
130	Wages	1,079,945	1,092,228	12,283
139	Wages - Gardeners	44,252	39,547	-4,705
200	Contractual Service	54,985	63,532	8,547
216	Maint. and Repair of Auto Equipment	14,700	10,087	-4,613
231-1	Purchase of Power for Resale	500,000	879,490	379,490
231-2	Service Charge for Transm. and Dist.	2,264,100	2,273,388	9,288
251	Subsistence of Employees	9,500	8,370	-1,130
300	Materials and Supplies	107,600	130,588	22,988
640	Water Rights and Damage Claims	24,000	12,128	-11,872
641	Hydrography	21,000	19,386	-1,614
801	Accident Compensation	12,000	31,620	19,620
812	Fidelity Insurance	53	72	19
813	Automobile Insurance	5,400	5,028	-372
814	Fire Insurance	10,500	10,382	-118
815	Miscellaneous Insurance	10,500	12,701	2,201
853	Assessments Paid to Other Districts	1,091	13,852	12,761
854	Membership Dues	351	412	61
855	Fee to U. S. Gov't. - Raker Act	30,000	30,000	-0-
856	Maint. Roads and Trails - Raker Act	25,000	12,500	-12,500
860	Retirement Allowance	325,471	305,851	-19,620
862	Social Security	78,687	78,687	-0-
865	Health Service System	26,331	26,331	-0-
870	Taxes	382,123	402,500	20,377
880	Rentals - Transmission Lines, Offices	122,400	122,400	-0-
900	Services of Other Departments	708,865	708,865	-0-
TOTAL OPERATION AND MAINTENANCE		\$ 6,589,265	\$ 6,947,701	\$ 358,436
400	Equipment	56,680	56,753	73
500	Additions and Betterments	426,930	426,930	-0-
700	Reconstruction and Replacement	497,321	497,321	-0-
800	Bond Interest and Redemption	8,976,941	8,932,328	-44,613
TOTAL		\$ 16,547,137	\$ 16,861,033	\$ 313,896

TABLE 2
HETCH HETCHY WATER AND POWER
TAXES
FISCAL YEAR 1971-72

<u>Tax Levy ing Bodies</u>	<u>Assessed Value</u>	<u>Total Amount of Taxes</u>
Alameda County	\$ 1,775.00	\$ 205.78
San Joaquin County	27,600.00	2,985.48
San Mateo County	2,985.00	324.28
Stanislaus County	95,430.00	9,568.56
Tuolumne County	4,684,206.00 (a)	388,206.96
Banta-Carbona Irrigation District	3,100.80	133.33
Oakdale Irrigation District	24,640.00	985.60
West Stanislaus Irrigation District	1,800.00	90.00
	\$4,841,536.80	\$402,499.99

(a) Includes \$3,800,548 assessment for water rights.

TABLE 3

TRANSIT POWER DIVISIONMOTIVE POWER SECTION - SUBSTATIONS

<u>Substation</u>	<u>Type(a)</u>	<u>Date Installed</u>	<u>No. of Units</u>	<u>kW Size</u>	<u>Fiscal Year 1971-72 Max. Load in kW</u>	<u>kWH Converted to 600 V d-c</u>
Bryant	M-G	1910	3	1500	2104	6,329,400
	M-G	1910	(b) 2	1500		
Turk	M-G	1910	3	1500	3060	8,126,700
	M-G	1910	(b) 2	1500		
Downtown	SC	1921	2	2000	3330	8,905,800
	SC	1924	1	3000		
Eighth Avenue	SC	(c) 1921	1	1500	1068	2,814,200
	SC	(c) 1921	(b) 1	1500		
	SC	1924	1	2000		
West Portal	MAR	1951	1	2000	2548	7,220,000
Outer Mission	MAR	1953	1	750	854	2,346,000
Geneva	M-G	1910	3	1500	780	<u>21,500</u> <u>35,763,600</u>

Notes: (a) Type of Conversion Equipment:

M-G = Motor-Generator

SC = Synchronous Converter

MAR - Mercury Arc Rectifier

- (b) Indicates units that are not serviceable. Units have not been repaired because of the high cost and because they are not needed to carry the present load. Also, it is planned to replace the conversion equipment with modern silicon rectifiers in the near future.
- (c) Units were originally installed at Washington and Mason in 1914 and were moved to Eighth Avenue in 1921.

TABLE 4

HETCH HETCHY WATER AND POWER

TRANSIT POWER DIVISION

COMPARISON OF BUDGETED AND ACTUAL EXPENDITURES

FISCAL YEAR 1971-72

<u>OE</u>	<u>DESCRIPTION</u>	<u>BUDGET</u>	<u>ACTUAL</u>	<u>UNDER, OVER</u>
110-1	Permanent Salaries	\$ 78,337	62,802	- 15,535
120-1	Temporary Salaries	-0-	2,216	2,216
130-1	Wages	825,104	753,943	- 71,161
	Materials & Supplies	52,400	56,412	4,012
	Accident Compensation	8,000	21,080	13,080
860-1	Retirement Allowance	103,914	90,834	- 13,080
862-1	Social Security	20,280	20,280	-0-
865-1	Health Service System	7,000	7,000	-0-
TOTAL OPERATION AND MAINTENANCE		<u>\$1,095,035</u>	<u>1,014,567</u>	<u>- 80,468</u>
400	Equipment	37,320	30,994	- 6,326
700-1	Reconstruction and Replacement	3,000,000	3,000,000	-0-
TOTAL		<u>\$4,132,355</u>	<u>4,045,561</u>	<u>- 86,794</u>

TABLE 5
HETCH HETCHY WATER AND POWER
SUMMARY OF RECEIPTS AND EXPENDITURES
FISCAL YEAR 1971-72

<u>RECEIPTS</u>	<u>BUDGET</u>	<u>ACTUAL</u>	<u>-UNDER OVER</u>
Revenue from Sale of Electrical Energy	\$ 14,102,200	\$ 14,502,230	\$ 400,030
Revenue from Sale of Water and Standby Charge, SFWD	5,000,000	5,000,000	-0-
Other Revenue	<u>95,000</u>	<u>109,723</u>	<u>14,723</u>
	\$ 19,197,200	\$ 19,611,953	\$ 414,753

<u>EXPENDITURES</u>			
Total Expenditures	\$ 20,658,949	\$ 20,906,594	\$ 247,645
EXCESS OF REVENUE OVER EXPENDITURES	<u>\$ -1,461,749</u>	<u>\$ -1,294,641</u>	<u>\$ 167,108</u>

TABLE 6
HETCH HETCHY WATER SUPPLY

PRECIPITATION, RUNOFF, STORAGE AND DELIVERY
AS OF JUNE 30 BY FISCAL YEARS

	<u>Normal</u>	<u>1967-68</u>	<u>1968-69</u>	<u>1969-70</u>	<u>1970-71</u>	<u>1971-72</u>
<u>SEASON PRECIPITATION (INCHES)</u>						
Hetch Hetchy	34.05	21.68	56.24	35.07	29.95	24.84
Lake Lloyd	46.60	30.80	76.45	51.95	41.94	32.74
Approx. Percent of Normal	100%	64%	162%	106%	88%	71%
<u>WATERSHED RUNOFF (ACRE-FT.) (a)</u>						
Hetch Hetchy	730,785	758,700	1,157,000	889,700	681,600	584,403
Lake Lloyd)	427,316	385,600	704,300	518,400	409,100	331,818
Lake Eleanor)	1,158,101	1,144,300	1,861,300	1,408,100	1,090,700	916,221
Total						79%
Approx. Percent of Normal		99%	161%	122%		
<u>RESERVOIR STORAGE (ACRE-FT.) (a)</u>						
Hetch Hetchy	293,680	349,575	357,208	356,617	324,530	
Lake Lloyd	197,916	260,021	243,854	199,983	151,653	
Lake Eleanor	27,100	26,339	24,286	27,016	27,403	2,110
Total	656,260	517,935	633,882	628,078	584,003	478,293
<u>DELIVERY TO SFWD (ACRE-FT.) (a) (b)</u>						
Average per day	502	561	564	576	640	
Maximum per day	861	853	856	748	750	
Total for fiscal year	185,342	205,426	206,514	210,992	257,046	

Total since operation of Hetch Hetchy Aqueduct began in 1934

3,929,870

NOTES: (a) One acre-foot equals 325,900 gallons or approximately 1/3 million gallons.

(b) Includes delivery to Livermore site, U.S. Atomic Energy Commission.

TABLE 7
HETCH HETCHY POWER SYSTEM

ELECTRIC ENERGY GENERATED, PURCHASED, AND DISTRIBUTED
FISCAL YEAR 1971-72

<u>PLANT DATA</u>	Nameplate Rating (Kilowatts)	Capability (Kilowatts)	Annual Plant Factor - %
Moccasin Powerhouse	90,000	104,000	58.7
Dion R. Holm Powerhouse	135,000	150,000	61.6
Robert C. Kirkwood Powerhouse	67,500	85,000	82.6
Total	292,500	339,000	
<u>ENERGY GENERATED AND PURCHASED (KILOWATT-HOURS)</u>			
<u>Gross Generation</u>			
Moccasin Powerhouse	534,930,000		
Dion R. Holm Powerhouse	809,617,000		
Robert C. Kirkwood Powerhouse	615,055,000		1,959,602,000
<u>Station Service</u>			
Moccasin Powerhouse	951,800		
Dion R. Holm Powerhouse	1,101,570		
Robert C. Kirkwood Powerhouse	903,070		2,956,440
<u>Net Generation</u>			1,956,645,560
<u>Supplementary Energy</u>			
"Bank" Withdrawal*		46,360,466	
Purchase (PG&E Co.)		108,734,434	
<u>Total</u>			2,111,740,460
<u>ENERGY DISTRIBUTED (KILOWATT-HOURS)</u>			
<u>Sales</u>			
Municipal Accounts	478,105,789		
Modesto Irrigation District	796,740,000		
Turlock Irrigation District	360,619,200		
Kaiser Cement and Gypsum Corporation	152,127,205		
Kaiser Aluminum and Chemical Corporation	33,996,000		
Norris Industries, Inc.	17,664,768		
Hercules, Inc.	57,906,000		
California Ammonia Company	80,876,760		
Air Products and Chemicals Co.			
Valley Nitrogen Producers, Inc.			
Miscellaneous Customers	759,065		
<u>Non-Revenue</u>			
Project Use	4,287,512		
"Bank" Deposit*	9,756,928		
<u>Losses</u>			
Hetch Hetchy System	42,679,015		
PG&E System (Municipal and Industrial Accounts)	76,222,218		
<u>Total</u>		2,111,740,460	

*In accordance with letter-agreement between City and PG&E Co. dated August 1, 1960.

TABLE 8
HETCH HETCHY POWER SYSTEM

COMPARATIVE ELECTRIC ENERGY SALES TO CUSTOMERS
FISCAL YEARS 1970-71 AND 1971-72
 (Nearest 100,000 Kilowatthours)

<u>CUSTOMER</u>	<u>1970-71</u>	<u>1971-72</u>
Municipal Accounts		
International Airport	184,500,000	199,800,000
Municipal Railway	64,100,000	61,900,000
Public Works	24,600,000	24,800,000
Street Lighting	43,400,000	44,500,000
Unified School District	34,400,000	37,100,000
Water Department	42,300,000	40,400,000
Other City Departments	64,800,000	69,600,000
Modesto Irrigation District	728,400,000	796,700,000
Turlock Irrigation District	321,500,000	360,600,000
Kaiser Cement and Gypsum Corp.	152,700,000	152,100,000
Kaiser Aluminum and Chemical Corp.	39,500,000	34,000,000
Norris Industries, Inc.	24,000,000	17,700,000
Hercules, Inc.	94,700,000	57,900,000
California Ammonia Company	104,300,000	80,900,000
Air Products and Chemical Co.	32,700,000	--
Valley Nitrogen Producers, Inc.	108,600,000	--
Miscellaneous Customers	700,000	800,000
 TOTAL	2,065,200,000	1,978,800,000

TABLE 9

HETCH HETCHY POWER SYSTEM

COMPARATIVE GROSS REVENUE RECEIVED FROM SALE OF ELECTRIC ENERGY
FISCAL YEARS 1970-71 AND 1971-72
(Nearest \$1,000)

<u>CUSTOMER</u>	<u>1970-71</u>	<u>1971-72</u>
Municipal Accounts		
International Airport	\$ 1,502,000	\$ 1,635,000
Municipal Railway	649,000	626,000
Public Works	299,000	307,000
Street Lighting	459,000	471,000
Unified School District	518,000	549,000
Water Department	372,000	362,000
Other City Departments	808,000	850,000
Modesto Irrigation District	4,295,000	4,640,000
Turlock Irrigation District	1,745,000	2,163,000
Kaiser Cement and Gypsum Corp.	1,270,000	1,337,000
Kaiser Aluminum and Chemical Corp.	342,000	324,000
Norris Industries, Inc.	275,000	193,000
Hercules, Inc.	678,000	434,000
California Ammonia Company	744,000	602,000
Air Products and Chemicals Co.	235,000	--
Valley Nitrogen Producers, Inc.	784,000	--
Miscellaneous Customers	<u>8,000</u>	<u>9,000</u>
TOTAL	\$ 14,983,000	\$ 14,502,000

TABLE 10

HETCH HETCHY POWER SYSTEM

ELECTRIC ENERGY GENERATED, PURCHASED, AND DISTRIBUTED BY FISCAL YEARS --- KILOWATT-HOURS

	<u>1966-67</u>	<u>1967-68</u>	<u>1968-69</u>	<u>1969-70</u>	<u>1970-71</u>	<u>1971-72</u>
<u>NET GENERATION</u>						
Moccasin Powerhouse	515,158,600	528,512,500	465,854,212	493,702,900	531,070,800	533,978,200
Dion R. Holm Powerhouse	789,570,220	733,220,320	944,664,850	887,037,320	892,230,400	808,515,430
Early Intake Powerhouse	3,000	---	---	---	---	---
Robert C. Kirkwood Powerhouse	<u>210,829,330</u>	<u>613,159,620</u>	<u>598,681,120</u>	<u>615,542,120</u>	<u>630,874,100</u>	<u>614,151,930</u>
Subtotal	1,515,561,150	1,874,892,440	2,009,200,182	1,996,282,340	2,054,175,300	1,956,645,560
<u>SUPPLEMENTAL ENERGY "Bank" Withdrawal* Purchase (PG&E Co.)</u>	<u>255,197,673</u>	<u>0</u>	<u>116,276,026</u>	<u>81,906,642</u>	<u>191,365,500</u>	<u>46,360,466</u>
				<u>40,798,879</u>	<u>0</u>	<u>108,734,434</u>
Subtotal	255,197,673	116,276,026	122,705,521	191,365,500	180,062,698	155,094,900
TOTAL	<u>1,770,758,823</u>	<u>1,991,168,466</u>	<u>2,131,905,703</u>	<u>2,187,647,840</u>	<u>2,234,237,998</u>	<u>2,111,740,460</u>
<u>DISTRIBUTION</u>						
<u>Sales</u>						
Municipal Accounts	361,956,735	388,836,371	412,201,831	427,168,499	458,127,155	478,105,789
Modesto Irrigation Dist.	512,112,000	557,184,000	597,864,000	637,972,000	728,371,000	796,740,000
Turlock Irrigation Dist.	206,568,000	248,457,600	263,616,000	271,156,800	321,456,000	360,619,200
Kaiser Cement & Gypsum	149,419,000	175,655,640	173,061,180	168,705,080	152,736,000	152,127,205
Kaiser Aluminum & Chemical	24,600,324	24,334,411	30,744,000	39,240,000	39,549,000	33,996,000
Norris Industries, Inc.	27,262,886	60,637,939	35,914,140	35,721,216	24,033,485	17,664,768
Dow Chemical Company	95,705,880	75,829,720	23,582,132	---	---	---
Hercules, Inc.	112,572,000	112,338,000	97,776,000	92,844,000	94,662,000	57,906,000
Shell Chemical Co.	50,346,000	50,570,000	---	---	---	---
California Ammonia Co.	18,992,040	100,845,672	101,720,736	103,020,000	104,280,480	80,876,760
Air Products & Chemicals	---	20,762,304	32,930,496	34,617,984	32,653,056	---
Valley Nitrogen Producers	---	---	28,675,920	124,884,480	108,631,560	---
Miscellaneous Customers	1,045,156	1,046,804	1,016,562	664,093	745,614	759,065
<u>Non-Revenue</u>						
Project Use "Bank" Deposit*	3,716,688	3,468,127	3,787,748	3,744,004	4,101,136	4,287,512
	110,919,058	60,324,204	205,895,527	135,151,010	47,826,652	9,756,928
<u>Losses</u>	<u>94,543,056</u>	<u>111,877,671</u>	<u>102,119,431</u>	<u>112,758,674</u>	<u>117,064,260</u>	<u>118,901,233</u>
TOTAL	<u>1,770,758,823</u>	<u>1,991,168,466</u>	<u>2,131,905,703</u>	<u>2,187,647,840</u>	<u>2,234,237,993</u>	<u>2,111,740,460</u>

*In accordance with letter-agreement between City and PG&E Co. dated August 1, 1960.

TABLE 11
BUREAU OF LIGHT, HEAT AND POWER

COMPARISON OF BUDGETED AND ACTUAL EXPENDITURES AND RECEIPTS
(INCLUDING ENCUMBRANCES)

FISCAL YEAR 1971-72

<u>OE</u>	<u>DESCRIPTION</u>	<u>BUDGET</u>	<u>ACTUAL</u>	<u>- UNDER +OVER</u>
<u>EXPENDITURES</u>				
110	Permanent Salaries	\$ 150,519	\$ 130,292	- 20,227
111	Allowance for Overtime	600	215	- 385
112	Holiday Pay	300	108	- 192
200	Contractual Services	1,400	896	- 504
231	Lighting and Heating of Public Buildings - General	1,135,195	1,221,131	85,936
231-1	Lighting and Heating of Public Bldgs. - Special Fund	4,259,959	4,215,127	- 44,832
231-2	Lighting of Public Streets - Pacific Gas and Electric Co.	600,858	572,995	- 27,863
231-3	Lighting of Public Streets - Hetch Hatchy	433,072	458,369	25,297
231-4	Lighting of Public Streets - Calif. Division of Highways	1,000	1,000	-
300	Materials and Supplies	675	477	- 198
813	Auto Insurance	550	444	- 106
860	Retirement Allowance	17,416	17,416	-
862	Social Security	4,925	4,925	-
865	Health Service System	2,046	2,046	-
954	EDP - PUC Data Processing	<u>12,000</u>	<u>12,000</u>	-
	TOTAL	<u><u>6,620,515</u></u>	<u><u>6,637,441</u></u>	<u><u>16,926</u></u>
<u>RECEIPTS</u>				
	Interfund Receipts*	\$ 5,327,007	\$ 5,382,454	55,447
	Ad Valorem Taxes	<u>1,293,508</u>	<u>1,254,987</u>	<u>38,521</u>
		<u><u>6,620,515</u></u>	<u><u>6,637,441</u></u>	<u><u>16,926</u></u>

WORK ORDER APPROPRIATIONS FROM ROAD FUND

<u>DESCRIPTION</u>	<u>TOTAL FUNDS</u>	<u>EXPENDITURE</u>	<u>- UNDER +OVER</u>
Maintenance and Repair of Street Lighting Installations	\$ 147,200	\$ 145,525	- \$ 1,675

*Transfers from other departments.

TABLE 12
BUREAU OF LIGHT, HEAT AND POWER

EXPENDITURE FOR ELECTRICITY FOR MUNICIPAL PURPOSES
FISCAL YEAR 1971-1972

<u>DEPARTMENT</u>	<u>NO. OF ACCOUNTS</u>	<u>CONSUMPTION KILOWATT-HOURS</u>	<u>EXPENDITURES</u>
Art Museum	1	701,568	8,086
Auditorium and Brooks Hall	1	4,291,400	47,711
Child Care Centers	9	125,357	3,069
City Planning	1	76,480	1,571
De Young Museum	1	2,712,000	26,636
Disaster Corp.	2	997	59
Electricity	5	456,099	7,939
Farmer's Market	1	25,687	594
Fire (a)	57	3,083,156	62,167
Hasaler Health Home	1	693,600	7,475
Health	21	14,234,651	139,094
Hetch Hetchy	6	134,230	3,670
Hidden Valley Ranch	1	872,400	10,518
International Airport (b)	7	199,825,830	1,634,727
Junior College District	13	7,008,326	74,590
Legion of Honor	1	440,000	5,946
Library	31	2,817,636	47,014
Log Cabin Ranch	13	362,771	9,996
Municipal Railway	37	61,947,434	626,234
Parking Authority	18	187,271	4,477
Police	17	921,855	18,501
Public Building	9	16,412,771	141,626
Public Works	71	24,489,602	300,624
Purchasing	5	500,839	7,530
Recreation and Park	198	10,289,016	176,187
Recreation and Park - Yacht Harbor	33	1,267,139	27,328
Sheriff	3	1,874,720	17,490
Social Services	7	1,248,664	16,694
Street Lighting Operations (.003)	-	44,482,256	458,369
Unified School District	226	30,067,038	474,432
War Memorial	1	1,280,432	16,260
Water	117	40,375,429	361,961
Youth Guidance	3	1,524,246	15,630
TOTAL MUNICIPAL DEPTS.	917	474,730,900	4,754,205
Academy of Sciences	2	3,084,946	27,826
Mount Davidson Cross Lighting	-	(c)	1,200
State of Calif: Street Lighting	1	(d)	12,115
Traffic Devices	1	289,943	5,732
TOTAL FROM HETCH HETCHY	921	478,105,789	4,801,078
Fire Dept., For Resale to Fort Mason	1	2,746,350	35,190
GRAND TOTAL	922	480,852,139	4,836,268

NOTES: (a) Electricity purchased for resale to Fort Mason excluded.

(b) Includes 160,587,573 KWH resold at Commercial rates for \$1,373,166 to Airport tenants.

(c) Included under Recreation and Park.

(d) Included under Street Lighting Operations.

TABLE 13
BUREAU OF LIGHT, HEAT AND POWER

EXPENDITURE FOR GAS AND STEAM FOR MUNICIPAL PURPOSES
FISCAL YEAR 1971 - 1972

NATURAL GAS

<u>DEPARTMENT</u>	<u>NO. OF ACCOUNTS</u>	<u>CONSUMPTION THERMS</u>	<u>EXPENDITURE</u>
Auditorium and Brooks Hall	2	821	87
Child Care Centers	7	25,637	1,900
City Planning	1	5,176	375
De Young Museum	1	298,361	18,603
Disaster Corp.	1	299	35
Electricity	2	53,554	3,686
Farmer's Market	1	778	70
Fire	58	706,778	48,051
Hassler Health Home	3	246,718	16,698
Health	21	6,741,104	260,353
Hetch Hetchy	2	781	93
International Airport	6	1,601,623	86,574
Junior College District	9	777,118	47,545
Legion of Honor	1	1,488	105
Library	29	115,129	8,289
Municipal Railway	12	275,854	18,841
Police	12	49,103	3,545
Public Buildings	5	1,447,134	81,707
Public Works	15	417,028	30,587
Purchasing	3	60,866	3,949
Recreation and Park	106	1,412,918	97,902
Registrar of Voters	1	8,580	609
Sheriff	2	391,701	23,007
Single Men's Rehabilitation Center	1	35,579	2,441
Social Services	5	71,021	5,234
Unified School District	216	4,310,794	287,715
War Memorial	3	258,128	17,416
Water	12	137,562	9,581
Youth Guidance	4	453,829	25,995
TOTAL MUNICIPAL DEPARTMENTS	541	19,905,462	1,100,993
Academy of Sciences	2	290,509	17,008
GRAND TOTAL	543	20,195,971	1,118,001

STEAM

(Does not include steam generated by City)

<u>DEPARTMENT</u>	<u>NO. OF ACCOUNTS</u>	<u>CONSUMPTION POUNDS</u>	<u>EXPENDITURE</u>
Social Services	1	2,389,700	4,241

TABLE 14
BUREAU OF LIGHT, HEAT AND POWER

STREET LIGHTS IN SERVICE
JUNE 30, 1972

<u>SIZE & TYPE OF LAMP</u>	<u>COMPANY-OWNED</u>	<u>JOINTLY-OWNED</u>	<u>CITY-OWNED</u>	<u>TOTAL</u>
<u>UNDERGROUND CONNECTED</u>				
<u>High Voltage Series Circuit</u>				
1,000-Lumen Incandescent	---	22	---	22
2,500 " "	256	24	109	389
4,000 " "	1,085	130	1,723	2,938
6,000 " "	580	457	3,269	4,306
10,000 " "	448	21	570	1,039
23,000 " Fluorescent	---	---	---	---
400-Watt Mercury Vapor	46	---	163	209
1,000 " "	---	---	3	3
175-Watt Mercury Vapor	---	---	8	8
250 " "	2	---	---	2
<u>Low Voltage Multiple Circuit</u>				
1,000-Lumen Incandescent	---	---	107	107
2,500 " "	17	4	67	88
4,000 " "	192	2	80	274
6,000 " "	42	5	82	129
10,000 " "	3	---	21	24
5,500 " Fluorescent	---	---	38	38
23,000 " "	39	---	2	41
100-Watt Mercury Vapor	---	---	104	104
175 " "	44	---	2,773	2,817
250 " "	34	---	941	975
400 " "	296	291	3,956	4,543
700 " "	---	---	362	362
1,000 " "	---	---	140	140
400 " Lucalox	---	---	21	21
<u>OVERHEAD CONNECTED</u>				
<u>High Voltage Series Circuit</u>				
2,500-Lumen Incandescent	2	---	---	2
4,000 " "	36	---	42	78
6,000 " "	2	---	---	2
<u>Low Voltage Multiple Circuit</u>				
2,500-Lumen Incandescent	16	---	---	16
4,000 " "	52	---	11	63
6,000 " "	4	---	---	4
175-Watt Mercury Vapor	14,937	---	1	14,938
250 " "	1,969	---	---	1,969
400 " "	941	---	---	941
TOTAL, JUNE 30, 1972	<u>21,043</u>	<u>956</u>	<u>14,593</u>	<u>36,592</u>
	57.5%	2.6%	39.9%	100%
TOTAL, JUNE 30, 1971	21,434	1,192	13,252	35,878
NET CHANGE DURING THE YEAR	-391	-236	+1,319	+692

TABLE 15
BUREAU OF LIGHT, HEAT AND POWER

EXPENDITURES FOR OPERATION AND MAINTENANCE OF STREET LIGHTING
FISCAL YEAR 1971-72

CONTRACTUAL SERVICE

P. G. & E. Company

Company-owned facilities (a)	805,242	
Jointly-owned facilities (a)	56,369	
City-owned facilities (b)	139,111	1,003,722
Less deduction for energy component		430,727
Emergency service to City-owned facilities		572,995
<u>Lease-Lite Corporation</u>		3,248
Group lamp replacement - City-owned facilities		44,257

MAHONEY ELECTRIC

Maintenance and repair - City-owned facilities

Routine maintenance	46,025	
Repair of damage caused by accidents (c)	28,064	
Repair of damage caused by equipment failure	15,432	
Repair of damage caused by vandals	2,037	91,558

MATERIAL AND SUPPLIES (FURNISHED BY CITY)

Damage caused by accidents (c)	15,346	
Damage caused by equipment failure	134	
Damage caused by vandals	-	15,480

ELECTRIC ENERGY (HETCH HETCHY)

44,482,256 kWh @ \$0.01345 less 21% discount	472,646
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TOTAL EXPENDITURE	1,200,184
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LESS AMOUNT PAID TO HETCH HETCHY FROM:

Gas Tax Funds for State Highway routes	12,128	
Recreation and Park Dept. for off-street lighting	2,098	14,226

TOTAL NET EXPENDITURE	<u>1,185,958</u>
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AVERAGE OPERATING COST

Based on number of lights in service June 30, 1971, average total cost of operation, maintenance and repair per light per year:

32.43

NOTES: (a) Includes maintenance, repair, fixed charges and electric energy for Company-owned facilities.

(b) Includes replacement of individual lamps and broken glassware, service and switching charges, and electric energy.

(c) When responsible party is known, claim is filed for recovery of cost.

TABLE 16

BUREAU OF LIGHT, HEAT AND POWERNEW CITY-OWNED STREET LIGHTING INSTALLATIONSCOMPLETED DURING FISCAL YEAR 1971-72

<u>Location</u>	<u>No. of Lights</u>	<u>Type of Lights (a)</u>	<u>Value</u>
Financed by 1964 Street Lighting Bonds:			
Cayuga, Mt. Vernon Area	38	M	38,452
El Sereno Court	1	M	970
Fell Street, Baker to Steiner	11	M	13,095
Fulton Street, and adjacent streets	128	M	138,202
Lakeside Area	58	M	76,893
Lincoln Way, Arguello to 30th	109	M	39,914
Miraloma Park Area	252	M	432,864
Pacific Heights Area	190	M	188,342
South of Market Area Contract 1A	234	M	287,152
South of Market Area Contract 1B	157	M	189,916
South of Market Area Contract 1C	133	M	178,018
South of Market Area Contract 2	127	M	185,398
Sacramento, Fillmore to Divisadero	45	M	40,795
TOTAL	1,483		1,810,011
Financed by State Gasoline Tax:			
Alamo Square Area Contract 1	16	M	34,230
Bernal Heights Stages I & II	54	M	40,860
Castro, Market to Duboce	22	M	39,522
Clayton, Corbett Stairway	1	M	1,140
Fell Street, Baker to Steiner	10	M	11,905
Golden Gate Heights	9	M	9,147
Mason Street, Sacramento to Pacific	15	M	20,947
Masonic, Geary to Page	123	M	65,670
Monterey Blvd., Ridgewood to Circular	102	M	92,515
North of Market Contract 2A	6	M	4,716
Pennsylvania Ave.	2	M	1,945
Pine Street, Van Ness to Presidio	97	M	98,941
Russian Hill Area Stages II & III	66	M	75,364
Webster, Golden Gate to Grove	20	M	23,680
Army Street Circle Contract 2	10	M	9,892
Winfield Street	12	M	9,060
Redevelopment Area E-1 Contract K	2	M	2,000
TOTAL	567		541,534
GRAND TOTAL	2,050		\$ 2,351,545

Notes: (a) M - Mercury Vapor
 I - Incandescent

TABLE 17

BUREAU OF LIGHT, HEAT AND POWER

HISTORICAL COST OF CITY-OWNED STREET LIGHTING IMPROVEMENTS

<u>Fiscal Year</u>	<u>Ad Valorem Taxes</u>	<u>Gasoline Taxes</u>	<u>Street Lighting Bonds</u>	<u>Property Owners</u>	<u>State Highway Dept.</u>	<u>Miscellaneous Sources*</u>	<u>Total</u>
Prior to July 1, 1953	\$1,748,675	\$611,115	-	\$576,404	\$22,650	\$477,651	\$3,442,495
1953-54	142,151	22,181	-	23,495	2,274	1,239	191,340
1954-55	155,727	30,817	-	748	16,578	543	204,413
1955-56	15,704	48,620	-	2,484	19,181	1,360	87,349
1956-57	114,168	26,641	-	7,256	-	3,003	151,068
1957-58	2,501	64,942	-	18,199	4,142	-	89,784
1958-59	-	171,367	-	10,231	626	538	182,762
1959-60	-	100,126	-	35,874	10,242	4,083	150,325
1960-61	-	82,074	-	19,236	-	1,865	103,175
1961-62	-	200,113	-	116,376	24,550	7,993	349,032
1962-63	-	84,328	-	21,700	-	-	106,028
1963-64	-	340,108	-	32,556	6,000	-	378,664
1964-65	-	97,846	-	8,975	50,857	-	157,678
1965-66	-	47,673	\$522,899	-	-	-	997,572
1966-67	-	111,173	188,312	5,000	-	-	304,476
1967-68	-	175,949	331,941	-	-	-	507,890
1968-69	-	374,229	616,722	-	40,250	-	1,031,201
1969-70	-	359,635	261,000	-	-	-	620,635
1970-71	-	490,031	1,550,442	-	-	-	2,040,473
1971-72	-	541,534	1,810,011	-	-	-	2,351,545
TOTALS	\$2,178,926	\$4,419,493	\$5,281,327	\$878,534	\$197,350	\$498,275	\$13,447,905
LESS:	Cost of portions removed prior to fiscal year 1970-71						
	Cost of Portions removed during fiscal year 1971-72						
	Original Cost of City-Owned Facilities in Service June 30, 1971						

*Includes WPA and PWA (1935-1942), Boulevard Construction (1932-1934), Municipal Transit System, Park and Recreation, and Housing Authority.

TABLE 18
HETCH HETCHY WATER AND POWER
CONSTRUCTION CONTRACTS
FISCAL YEAR 1971-72

<u>Contract No.</u>	<u>Description</u>	<u>Contractor</u>	<u>Contract Time Completed</u>	<u>Original Contract Price</u>	<u>Value of Work Done During Fiscal Year</u>
HH-423	Moccasin Reservoir Bypass	Glanville Construction Co.	5-24-71 3-8-72	1,028,168	1,026,866
HH-428	Restoration of Trolley Overhead on Mission & 16th St.	Abbet Electric Corp.	9-28-70 7-28-71	109,278	2,022
HH-429	Construct Three Residences Early Intake	Hetch Hatchy Water and Power	6-11-71 4-3-72	95,000	102,146
HH-430	Extension of Utilities to Three Residences at Early Intake	City Appliance and Electric	6-28-71 10-22-71	21,995	21,995
HH-431	Repairs to Holm Penstock	OBCO Contractors & Eng.	7-26-71 10-7-71	66,050	68,404
HH-432R	Seal Coat and Road Repairs Jones Point to Mather Highway 120 to Cherry Dam Moccasin Village Area, & Surfacing Holm Powerhouse Road	Harold Tower Construction	5-17-71 7-28-71	91,925	51,606
HH-433	Moccasin-Newark Transmission Line - Paint Steel Tower (Towers 266N to 458N)	Clinton A. White Painting Company	9-28-70 7-28-71	14,750	295
HH-434	Replacement of metal roofing and Siding Moccasin Shops	Roofing Constructors, Inc.	9-7-71 3-4-72	53,763	56,271
HH-435	Repairs to Holm Powerhouse	Western Waterproofing, Inc.	7-19-71 9-15-71	12,584	12,584
HH-438	Paint and Remodel Moccasin Administration Bldg. and Dormitory	Charles I. Cunningham Co.	8-2-71 -	23,888	18,274

TABLE 18 (Cont'd)
HETCH HETCHY WATER AND POWER

CONSTRUCTION CONTRACTS
FISCAL YEAR 1971-72

<u>Contract No.</u>	<u>Description</u>	<u>Contractor</u>	<u>Contract Time Started</u>	<u>Contract Time Completed</u>	<u>Original Contract Price</u>	<u>Value of Work Done During Fiscal Year</u>
HH-439	Clearing Transmission Line Rights of Way	Pacific Tree Expert Co.	9-13-71	4-28-72	30,389.50	27,961.00
HH-440R	Paint Steel Trolley Poles	J. Wm. Sorenson	9-27-71	-	51,240.00	45,661.00
HH-441	Additions to Truck Port and Washing Facilities Moccasin	Charles I. Cunningham	11-15-71	3-22-72	29,999.00	29,999.00
HH-442	Motorize Valve - San Joaquin Pipe Line - Oakdale Portal and Tesla Portal Valve Houses	OBCO Contractors and Engineers	6-1-71	-	28,280.00	3,402.00
HH-445	Outer Mission Substation Car Guard	Wm. McIntosh & Son	9-20-71	10-19-71	1,439.00	1,505.00
HH-447	Post Street Trolley Coach Overhead	Abbett Electric Corp.	10-26-71	-	265,378.00	198,560.00
HH-449	Cottage No. 1 O'Shaughnessy Dam Renovate and Repair	Charles I. Cunningham	5-3-71	11-16-71	3,888.00	3,888.00
HH-455	Moccasin-Newark Transmission Line, Paint Steel Towers (111-N to 262-N)	C. C. Knight Painting	9-13-71	10-4-71	20,500.00	20,500.00
HH-456	Resurface Mather-Hetch Hetchy Road	George Reed, Inc.	9-13-71	10-14-71	118,890.00	130,890.00

TABLE 18 (Cont'd)
HETCH HETCHY WATER AND POWER

CONSTRUCTION CONTRACTS
FISCAL YEAR 1971-72

<u>Contract No.</u>	<u>Description</u>	<u>Contractor</u>	<u>Started</u>	<u>Completed</u>	<u>Value of Work Done During Fiscal Year</u>
HH-458	Relocation of Moccasin-Newark Transmission Line Tower No. 970	Abbett Electric Corp.	8-16-71	9-10-71	12,975.00
HH-459	Replacement of Electric Substation, Alameda East Portal	Brayer Electric Co.	4-17-72	-	9,477.00
HH-461	Improvements to Domestic Water Supply, Moccasin	E. H. Morrill Co.	5-22-72	-	37,824.00

Total Amount of Hetch Hetchy Contract Work Performed During Fiscal Year:

\$1,835,804.00

TABLE 19
HETCH HETCHY WATER AND POWER
PURCHASE ORDERS FOR EQUIPMENT
FISCAL YEAR - 1971-72

<u>Purchase Order No.</u>	<u>Description</u>	<u>Contractor</u>	<u>Contract Started</u>	<u>Contract Completed</u>	<u>Value of Work Done During Fiscal Year</u>
R-70155	Synchronous Generators for Moccasin Powerhouse	Ferrostaal Pacific Corporation	1-18-66	1-28-72	807,266
R-63758	Synchronous Generators for Moccasin Powerhouse	Ferrostaal Pacific Corporation	1-18-66	1-28-72	1,050
Total Amount of Work Done Under Hatch Hetchy Purchase Orders During Fiscal Year					\$59,401

